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ADDRESS.

THE ETIOLOGY, PATHOLOGY AND DIAGNOSIS OF INTESTINAL TUBERCULOSIS.

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Renewed interest has been awakened in the subject of intestinal tuberculosis since recent experience in modern aggressive surgery has taught the profession that some of the cases in which the disease occurs as a primary affection are amenable to successful surgical intervention. Intestinal tuberculosis appears under so many different pathologic forms and presents such various clinical aspects, that it becomes necessary to inquire carefully into its etiology and pathology, in order to enable the surgeon to exercise the necessary care in the selection of cases for operative treatment. The field of abdominal surgery is rapidly increasing in extent and usefulness, and one of its most recent acquisitions is the successful treatment of certain forms of intestinal tuberculosis.

It is my intention on this occasion to discuss as briefly as possible the etiology, pathology, symptoms and diagnosis of this affection of the intestinal canal, with special reference to the indications which dictate and warrant surgical interference.

Frequency of intestinal tuberculosis.—Intestinal tuberculosis is a very common complication of pulmonary and miliary tuberculosis. It is not often met with as a primary affection. In one thousand tubercular subjects examined postmortem in the Pathological Institute at Munich between the years 1886 and 1890, only one case of primary intestinal tuberculosis was noted, while in 566 cases secondary intestinal tuberculosis was seen.

That the disease occasionally occurs as a primary affection can no longer be doubted; the results of an enormous clinical experience and thousands of necropsies furnish a substantial verification of this fact. There can, however, be but little doubt that in many cases of tuberculosis of the intestine in which the clinical features point only to this organ as the sole seat of disease, careful search would reveal old, perhaps latent tubercular foci in some other part of the body. The prudent surgeon selects for his operative work only the cases in which he has reason to believe, from the clinical history and the signs and symptoms presented, that the disease is limited and confined largely if not entirely to the intestinal canal.

Tuberculosis of the stomach.—As primary intestinal tuberculosis is for the most part a feeding disease, it is interesting to know whether or not the stomach is ever the seat of tubercular infection. For good reasons we have for a long time assigned to the gastric juice a destructive, or at least an inhibitory effect on pathogenic bacteria, but the results of experimentation and clinical observations seem to combine in proving that the virulence of the bacillus of tuberculosis is little if any impaired on its way through the stomach. It is natural to assume that in cases in which the physiologic activity of the glandular appendages of the stomach is lessened, the antiseptic properties of the gastric secretions would be correspondingly diminished. The correctness of this statement is borne out by the experience of many reliable clinicians and by the results of experimentation on the lower animals. Blumer (*Albany Medical Annals*, March, 1898) reports a case of tuberculosis of the stomach in which he found postmortem an old caseous area at the apex of the right lung which had softened at the lower part, general miliary tuberculosis, tuberculous ulcers of the stomach and ileum, tuberculosis of the kidneys and of the aorta. The stomach lesion consisted of three or four small, shallow, circular ulcerations, and near them, numerous miliary tubercles. Blumer has studied the literature of the subject and finds but thirty cases on record, in all of which the gastric lesion was secondary to tuberculosis elsewhere. He divides the reported cases into miliary tuberculosis, and single and multiple ulcerations. Four were cases of pure miliary tuberculosis of the stomach wall; about eight were single and the remainder multiple ulcers.

Tuberculosis of the stomach usually occurs only in connection with similar affections of other organs, especially the intestinal and lymphatic glands. The ulcers are pale and have thickened edematous edges. The inflammatory product presents the usual evidences of the nature of the disease—giant cells, bacilli and perhaps cheesy material. The disease in this locality presents no characteristic symptoms. Perforation and hemorrhage may occur under the same circumstances as in intestinal tuberculosis. The ulcer presents a sharp contrast to its dark-colored surroundings. In a few cases the serous coat over the floor of the ulcer is studded with miliary tubercles. In Litten's case the tuberculosis of the digestive tract was limited to the stomach. Similar cases have been described by Talamon-Balzer, Gilles and Eppinger. Musser ("Tubercular Ulcer of the Stomach," Philadelphia Hospital Reports, Vol. i, p. 117) found a tubercular ulcer of the stomach one and one-half by three and one-half inches on postmortem examination of a patient who had died of pulmonary tuberculosis. Tubercle bacilli were found in the cheesy material. Most of the cases of tubercular ulcer of the stomach have been observed in children. The disease presents no characteristic symptoms. Musser claims that death in these cases often results from hemorrhage.

Tuberculosis of the stomach is a very rare affection, as is shown by the researches of Letorey (Thèse de Paris, 1895), who was able to find an account of only

twenty-one cases. This rarity is explained, to a certain extent, by the well known action of the gastric juice on the bacillus tuberculosis, which either dies or loses its virulence in an acid medium. Absence or diminution of hydrochloric acid would therefore favor the development of tubercular lesions, as would also other affections which impaired the digestive functions of the stomach. Letorey believes that the bacillus reaches the stomach more frequently by the way of the circulation than by entrance with infected food. The disease is more frequently demonstrated in the autopsy room than at the bedside. The usual site of the ulceration is near the pylorus and on the larger curvature. In only six cases out of the twenty-one was more than one tubercular ulcer noted, so that the lesion may be said to be generally single, the ulcer round or oval, with ragged and bleeding edges and a grayish-yellow floor. The ulcer occasionally reaches a diameter of from three to five centimeters. The prognosis in these cases is grave, since the patient usually dies from the effects of the primary pulmonary affection or tuberculosis of other organs, the gastric complication perhaps hastening the fatal termination. The occasional occurrence of tubercular gastritis is the best possible proof that the bacillus of tuberculosis may pass through the stomach, subjected to the action of the gastric juice, and still retain sufficient virulence on its entrance into the intestinal canal to exercise its specific pathogenic action upon the tissues prepared for its reception and multiplication by hereditary or acquired predisposing causes.

Etiology.—Primary tuberculosis of the intestinal canal is the result of infection from without by the ingestion of food contaminated with the essential cause of the disease, the bacillus of tuberculosis, usually in the form of tubercular milk and meat. The secondary form is caused by auto-infection by the entrance of tubercular sputa into the intestinal canal. The lymph follicles and Peyer's patches furnish the most favorable anatomic conditions for the localization and growth of the tubercle bacillus. Klebs believes that the introduction into the intestinal canal by the swallowing of sputa in phthisical patients is a frequent cause of intestinal tuberculosis. He discovered two tubercular ulcers in the stomach of a patient who had died of pulmonary tuberculosis. The supposition that intestinal tuberculosis is often caused by the ingestion of tubercular food or sputa is supported by the experiments of Malin, Parrot and Bonley, who found that animals fed with the expectorations of consumptives died of tuberculosis; while Chauveau, Bollinger and others succeeded in producing intestinal tuberculosis by feeding animals susceptible to the disease with fragments of tubercular lungs or with raw tubercular meat. The experiments of Gerlach, Zürn and Klebs demonstrated the dangers attending the use of milk from tubercular cows. In these experiments it was noted that the disease commenced in the form of an intestinal catarrh, and that the extension of the tubercular infection began through the mesenteric glands before the development of diffuse miliary tuberculosis. W. Zinn ("Ein Fall von Fütterungstuberculose bei einem erwachsenen Menschen, mit Ausgang in Miliartuberculose," *Münch. Med. Wochenschrift*, 1895, No. 37) observed a man 29 years of age who in the course of nine weeks died of acute miliary tuberculosis. The autopsy showed that the miliary tuberculosis had its origin in a mass of caseous tubercular mesenteric glands. No other old tubercular deposit could be found. In the intestine, at a point corresponding to the diseased glands, was found the scar which followed the healing of a tubercular ulcer. The ulcer was evidently the primary lesion which led to tubercular lymphadenitis, and finally death followed from reinfection of the body from the tubercular glands, long after the intestinal ulcer had healed. General infection in this case took place through the thoracic duct. Wyss ("Zur Kasuistik der primären Darmtuberkulose im Kindesalter," *Correspondenzblatt f. Schweizerärzte*, 1893, No. 22) found in seventy-one postmortems on children three instances of undoubted primary intestinal tuberculosis. In one case, a girl $5\frac{3}{4}$ years old who had died of diphtheria, a solitary tubercular ulcer was found in the ileum with extensive tuberculosis of the mesenteric glands. No trace of tuberculosis could be detected in any other organ. Upon inquiry it was ascertained that the child had been fed on milk almost exclusively for some time before she contracted diphtheria. In the other two cases the disease could be traced to the same cause.

Intestinal tuberculosis is found most frequently in children and young adults, although no age is entirely exempt. In the language of Virchow: "the predisposition to tuberculosis, the hereditary vulnerability resides in the tissues, and that the younger and more incompletely developed these are, the more readily will the vulnerability manifest itself in the presence of exciting causes." This may explain the special frequency of intestinal tuberculosis in children and in subjects affected by antecedent inflammatory affections of the intestinal mucous membrane.

Baumers ("Recherches sur la maladie propre aux enfants") first called attention to intestinal tuberculosis in children, which has been known as tabes S., phthisis mesaraica, febris mesaraica, febris xanthus infantum and intestinal scrofula. Intestinal tuberculosis in children results in early and extensive infection of the mesenteric glands, from which reinfection usually terminates life by miliary tuberculosis. Secondary tuberculosis appears to be more frequent in adults than in children. In children intestinal tuberculosis is not within 30 to 40 per cent., in the adult in 60 to 70 per cent. The local predisposing lesion, although important in determining localization, is not essential, as the tubercle bacilli can penetrate the intact mucous membrane.

In six of Czerny's cases subjected to operative interference the patients were between 25 and 50 years of age, the average age being 39. In four of the cases tuberculosis was hereditary, in two cases the disease followed typhoid fever, and in one it was preceded by an acute attack of parametritis. In three of the cases the intestinal disease was complicated by pulmonary tuberculosis, and in one by diffuse miliary tuberculosis. In one case the infection occurred by the rupture of a tubercular adnexal abscess into the intestine, and in another the intestinal tuberculosis was complicated by actinomycosis.

Clinical experience has shown that intestinal tuberculosis pursues a more benign and chronic course in the adult than in children, and consequently the primary form of intestinal tuberculosis amenable to successful surgical treatment is met with most frequently in young adults and persons of advanced age, seldom in the case of infants and young children.

Infection from the blood is undoubtedly of quite common occurrence in primary and secondary intestinal tuberculosis. The most favorable cases for suc-

cessful surgical intervention are those in which a localized predisposing lesion furnishes an infection atrium for the entrance of tubercle bacilli into the tissues. These are the cases in which characteristic solitary or multiple tubercular ulcers develop which manifest an intrinsic tendency to heal, and in which an operation finally becomes a necessity after symptoms of obstruction indicate the existence of a cicatricial stenosis.

Pathology.—Intestinal tuberculosis presents itself clinically and pathologically in the form of a chronic catarrhal or ulcerative enteritis. The inflammation which follows the tubercular infection is characterized by a series of pathologic processes common to all tubercular affections, influenced and modified, however, by the structure and function of the tissues involved. The primary seats of infection are the glandular appendages of the mucous membrane, the lymph follicles and Peyer's agminated glands. The mode of infection resembles typhoid fever in many respects. The lower portion of the ileum and the ileo-cecal region are the most frequently infected, although any portion of the intestinal canal may be involved primarily or by extension. Of six cases of intestinal tuberculosis reported by Schiller ("Ueber die Darm Operationen an der Heidelberger Chirurgischen Klinik aus den letzten vier Jahren." Dissertation, 1896), which were operated upon by Czerny during a period of four years, the disease involved the ileo-cecal region four times, and the descending colon twice. In all cases of cecal tuberculosis operated upon by Czerny, the ulceration was limited on one side by the ileo-cecal valve; the mucous membrane of the cecum was extensively ulcerated, presenting elevations and depressions and polypoid excrescences between the ulcers; the cecal wall was much thickened and indurated. The lumen of the cecum was usually found contracted, the stenosis being the direct cause of the intestinal obstruction. In one case the mechanical impediment was found to be a sharp flexion at the insertion of the ileum into the cecum. In one case the contracted lumen of the cecum was divided by a band of cicatricial tissue. The bowel below the obstruction was, as is always the case, nearly empty, reduced in size and anemic, while on the proximal side reverse conditions existed, which facilitated circular suturing after excision. In acute cases, such as are observed in children, and which seldom come to the notice of the surgeon, the disease is usually diffuse and often implicates a large section of the intestinal canal above the ileo-cecal valve. Tuberculosis is apt to attack a portion of the intestinal canal subjected to mechanical irritation, as is the case in hernia.

A number of cases of tuberculosis of hernia have been reported. Bruns ("Beiträge zur Klin. Chirurgie," B. ix, p. 206) adds one new case to those previously published. In these thirteen cases the hernial sac was attacked ten times, and in seven it was alone the seat of disease. This, together with other conclusions, substantiate the belief, that "tuberculosis of hernia" may occur as a primary disease; generally, however, it is associated with peritoneal tuberculosis.

It appears from the present literature on the subject that tuberculosis in the ileo-cecal region and the colon is usually a disease of adults, although there are a few cases on record in which the intestinal canal at and below the ileo-cecal region was affected in children not more than 10 years of age.

Reclus (*Le Bulletin Médicale*, June 25, 1893) has called attention to the rapidly increasing number of cecal tuberculosis cases which have been operated upon. The cases of Bouilly, Terrier, Hartmann, Reynier, Broca, Roux, Salzer, Billroth and Hochenegg, the anatomical researches of Duguet, Spillmann, Hérard, Cornil and Hanot, and the more recent descriptions of Pilliet and of Le Bayou have thrown some light upon this hitherto but little recognized affection. This affection may manifest itself as a localized tuberculosis without infiltration and as a purely local disease. This suffices to place this intestinal lesion among the surgical tuberculoses. From the moment it is a limited focus and this focus is accessible, in such favorable circumstances intervention is legitimate. The greatest number of cases of cecal tuberculosis so far reported have been over 25 years of age.

It seems that two distinct anatomo-pathologic forms may be described, associated with different symptoms; the one a fibrous and the other an ulcerating variety; moreover, these may be combined, or there may be noticed many intermediate stages between the varieties. The majority of cases thus far reported have been characterized by an abundant tissue proliferation, which imparted to the swelling much of the aspects of carcinoma. The inflammatory mass is almost always found freely imbedded in plastic adhesions, and it is difficult if not impossible to outline the anatomic landmarks of the parts involved. Ordinarily the lesions are most marked around the ileo-cecal valve. The appendix is generally affected and constitutes a portion of the inflammatory mass.

The second or ulcerated form may present thickening of the peritoneum and adhesions around the intestinal loops, but these have not the remarkable hypertrophy of the other form; on the contrary the ulcerative process predominates, the mucosa has often completely disappeared, especially at the site of the ileo-cecal valve. Ulceration often leads to abscess and fistula formations. The fistulous openings are often multiple.

Cornil believes that in such cases the primary infection takes place in the appendix vermiformis, more especially when it is the seat of a fecal concretion or foreign body.

The tubercular infection may take place in the upper portion of the intestinal canal. Claude ("Ulcérations tuberculeuses du duodénum," *Bulletin de la Société anatomique de Paris*, No. 8, 1896) made a postmortem on a man 33 years of age who had died of pulmonary tuberculosis. He found tubercular ulcers in the upper portion of the duodenum; four other ulcers were found in the ileum. He attributed the intestinal disease to infection from the blood. During life this patient never showed any symptoms referrable to the intestinal canal. The tubercular nature of the intestinal affection was established by histologic and bacteriologic examinations.

The entire length of the intestinal canal is seldom affected by tuberculosis, and in the exceptional instances when this is the case the disease pursues a rapidly fatal course. It has already been stated that intestinal tuberculosis always begins in the lymph follicles or Peyer's patches. The tubercular process is at first submucous, and reaches the surface only after degeneration and ulceration have taken place. The glands become swollen, can be felt under the epithelial lining as small hard nodules, which present a grayish color before caseation sets in. With the onset of caseation the swelling increases in size and

assumes a yellowish color. As soon as the overlying epithelial lining is destroyed softening of the inflammatory product and ulceration set in. The primary ulcer is small and round with yellowish margins. At the time the crater-like defect takes place the mass is not larger than a hemp-seed. Such small ulcers may heal, but more frequently progressive extension takes place in the direction of the blood vessels. In Peyer's patches the appearance of sieve-like defects can be seen during the early stages of the disease, which Rokitansky described as primitive tubercular ulcerations. They constitute the preparing stage or secondary tubercular ulcers. Even in superficial ulcers tubercles can constantly be found between the muscular fibers. By confluence and progressive infection the surface defects increase in size. Not infrequently remnants of intact mucous membrane remain between the different points of ulceration. The shape of the ulcer is variously modified by the confluence of several ulcers. The most extensive ulcers are found in the cecum, colon and terminal portion of the ileum.

The intrinsic tendency of intestinal tubercular ulcers is to increase in size in the direction of the blood vessels; that is, transversely to the long axis of the bowel, a pathologic feature which was first pointed out by Rokitansky (Lehrbuch der path. Gewebelehre," 1871, p. 327). The tubercular infection follows the lymph sheath of the blood vessels. Through the lymphatics the infection extends to the serosa, upon the surface of which miliary tubercles are often found over an area corresponding in extent to the base of the ulcer. The mesenteric glands are infected through the same channels. In children the mesenteric glands are often affected without an antecedent intestinal lesion. In such cases the tubercle bacilli penetrate through the mucous membrane and enter the lymphatic system without producing a demonstrable surface lesion, or infection takes place by the way of the general circulation. Infection through the mucous membrane undoubtedly is often determined by catarrhal enteritis, which damages the epithelial lining and prepares the way for invasion from the intestinal canal.

Extension of the ulcer in the muscular coat takes place by progressive extension of the ulcerating process and by diffusion of the infection through the lymph channels (Figs. 1 and 2). As soon as the serous coat is reached secondary plastic peritonitis is almost the constant result. Usually the peritonitis is limited to the affected portion of the bowel, between which and the adjacent viscera firm adhesions are formed. In exceptional cases the peritonitis becomes profuse without perforation. More frequently, however, the diffuse tubercular peritonitis is caused by the rupture of a peri-intestinal tubercular abscess. Perforation of a tubercular ulcer is often prevented by early and firm adhesions. In one of the cases reported by Rindfleisch the intestine was found perforated at five different points without causing diffuse peritonitis, owing to the existence of firm adhesions. Perforative peritonitis is so rare in intestinal tuberculosis that Leube saw only two cases during his service in the clinic at Erlangen. Leudet reports six cases that occurred in his practice, which were due to tubercular affection of the appendix. Eisenhardt ("Ueber die Häufigkeit und Vorkommen der Darmtuberculose," Dissertation, Munich, 1891) found perforation in 28 out of 566 cases of intestinal tuberculosis examined postmortem. Extension of the disease to other parts and organs frequently takes place through the lymphatic system.

Tubercular lymphadenitis is a frequent and, in

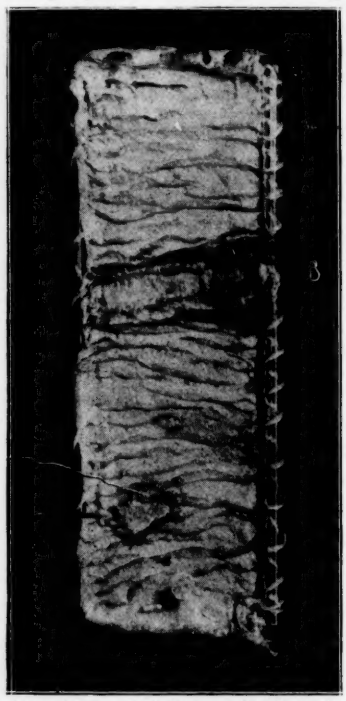


Figure 1.—Tubercular ulcer of ileum. [Pathological Museum Rush Medical College.] a, round tubercular ulcer of ileum; b, narrow circular annular tubercular ulcer of ileum.

long-standing cases, a constant concomitant pathologic condition, as was first pointed out by Schüppel and Rindfleisch. The observations occurring during operations made for intestinal tuberculosis and the

Figure 2.—Diffuse annular tubercular ulcer of ileum. [Pathological Museum Rush Medical College.]

results of postmortem examinations combine to show that retrograde metamorphosis of the inflammatory product of the tubercular glands takes place very slowly. The writer has seen repeatedly tubercular

mesenteric glands as large as a hazel-nut which had not undergone any decided cheesy degeneration. Coagulation and caseous degeneration, however, occur in the course of time, but liquefaction and abscess formation in and around tubercular mesenteric glands are of rare occurrence. Infiltration and thickening of the intestinal wall occur most frequently and reach the maximum height in cases in which the tuberculosis is located in the ileo-cecal region or colon. In these localities the disease is most frequently primary, a fact which would explain its chronicity and comparatively benign nature. When the tubercular process affects this part of the intestinal canal the resultant swelling is often of larger size and has frequently been mistaken for malignant disease. In such instances the intestinal wall has been found several centimeters in thickness.

In acute cases of intestinal tuberculosis the ulcers manifest little or no tendency to repair. In chronic cases attempts at healing or complete healing is the rule. Eisenhardt (*op. cit.*) in examining the postmortem records of 566 cases of intestinal tuberculosis, found that healing was completed in only 10, while in 25 instances the ulcers were only partly healed.

Attempts at cicatrization are frequently seen, but very often while healing is going on in one part of the ulcer progressive infection and destruction are witnessed in another portion. The healing of a tubercular ulcer of large size requires an enormous quantity of new material, which is composed largely of new connective tissue. The scar tissue always evinces a tendency to contraction, which leads to stenosis and flexion. If the ulcer is circular, healing is attended by contraction of the lumen of the bowel, which finally leads to intestinal obstruction. If only one side of the circumference of the bowel is ulcerated, healing will result in contraction and flexion. The healing of several tubercular ulcers gives rise to the development of multiple strictures, which have been found by several surgeons in operations for intestinal obstructions. Progressive cicatricial contraction may eventually result in almost complete obliteration of the lumen of the bowel. In one of Scheuer's cases the stricture at the time the intestinal resection was performed for obstruction was so narrow that it admitted only a probe three millimeters in size. The healing of intestinal tubercular ulcers is seldom followed by complete recovery, as all such patients are liable later to intestinal obstructions and reinfection from the tubercular mesenteric and retroperitoneal glands.

Symptoms.—Intestinal tuberculosis may run its entire course from beginning to end without any symptoms which would point to the intestinal canal as the principal seat of the disease. Tubercular ulcers of the intestines are often found at autopsies without the slightest evidence of their existence during life. That an isolated tubercular ulcer of the intestine may exist without causing symptoms before perforation occurs, is shown by a case reported by Baumgarten ("Ueber latente Tuberculose," Volkmann's *Klinische Vorträge*, No. 218). A young soldier, in almost perfect health, died suddenly of perforative peritonitis. The postmortem revealed, as the cause of the peritonitis, a solitary perforated ulcer, the size of a penny, in the lower portion of the ileum. Microscopic examination of the tissues demonstrated the tubercular nature of the ulcer. No evidence of tuberculosis was found in any other organ of the body.

In other cases the symptoms are misleading. Thus Leonhardi-Aster (Ueber einen unter dem Bilde perniciöser Anæmie verlaufenden Fall von Darmtuberculose," *Deutsche Zeitsch. f. prakt. Med.*, 1878, Nos. 8 and 9) recorded a case of intestinal tuberculosis which presented all the clinical features of pernicious anemia, the intestinal symptoms being masked by the progressive anemia for which no cause could be assigned until the necropsy revealed the characteristic pathologic lesions of intestinal tuberculosis. In cases of diffuse acute intestinal tuberculosis the most important and prominent symptoms point to the existence of an intestinal catarrh. Profuse diarrhea is seldom absent, the stools being copious and liquid. Colicky pains referred to the umbilicus, slight tenderness on deep pressure, progressive emaciation and more or less rise in temperature, especially toward evening and during the night are symptoms well calculated to arouse suspicion in regard to the probable tubercular nature of the intestinal disease. Enlarged mesenteric glands can often be palpated through the thin and relaxed abdominal wall. In some cases enlarged mesenteric and retroperitoneal glands can be detected by vaginal or rectal examination. The severity of the diarrhea is attributable more to the existence of the complicating intestinal catarrh and increased peristalsis than to the ulcers themselves. Pulmonary tuberculosis, as well as tuberculosis of any other important organ, often overshadows and masks the intestinal complication. In all cases of pulmonary tuberculosis attended by diarrhea, which does not yield to the ordinary treatment, we have reason to assume the existence of intestinal tuberculosis. In primary intestinal tuberculosis the early symptoms set in insidiously, the disease is usually mistaken for an ordinary intestinal catarrh and is regarded as such until the negative results obtained from the treatment induces the physician to make a more thorough investigation of the case. The suspicions of the tubercular nature of the intestinal disease are materially strengthened if it can be ascertained that the patient has made unsterilized milk a staple article of diet.

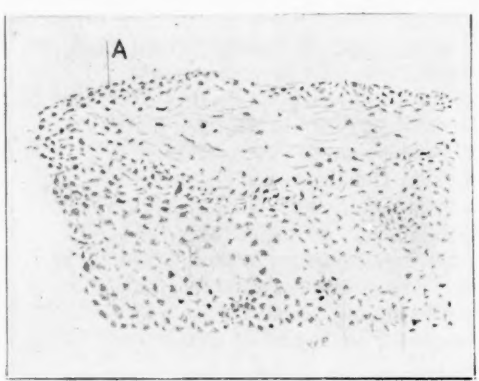
The frequent presence of traces of blood in the stools is decidedly suspicious. If the ulcers are located in the small intestine the blood is intimately mixed with the stools; if in the large intestine the extravasated blood often forms a coating for the otherwise well formed fecal masses. Pus in the stools is found, as a rule, only when the tubercular process involves the lower portion of the large intestine. In the small intestine the pus that forms on the surface of the ulcers is speedily washed away with the intestinal discharges and, on the other hand, pus formation is checked by the peptic action of the intestinal juice, which acts as an efficient antiseptic. Bamberger has called attention to the character of the stools in intestinal tuberculosis, which according to this authority frequently contain transparent particles of mucus resembling frog spawn or boiled sago grains. These masses of mucus are probably formed in and are discharged from the lymph follicles of the intestinal mucous membrane, the structures primarily affected by the tubercular process.

Virchow places less diagnostic importance on the presence of this pathologic product, which he believes has often been mistaken for partially digested starch.

The partial or complete healing of a tubercular ulcer of considerable size is usually announced clinically by the appearance of a complexus of symptoms which

indicates the existence of chronic intestinal obstruction, caused by the cicatricial stenosis which so constantly attends and follows the healing of a tubercular ulcer. Intermittent colicky pains in the umbilical region, diarrhea alternated with constipation, and perhaps occasional attacks of vomiting, are the most prominent clinical manifestations in such cases. Chronic intestinal obstruction from this, as well as other causes, often terminates in an acute attack. In rare cases, the chronic obstruction presents few or no symptoms until symptoms of acute obstruction set in, when operation or autopsy reveal the presence of an old cicatricial stenosis, which was never suspected before the abdomen was opened.

The formation of a chronic abscess in the ileo-cecal region, or any part of the abdominal wall, in connection with intestinal symptoms of long standing, always suggests the probable existence of a tubercular intestinal ulcer. The writer has always observed these in the ileo-cecal region, over the ascending colon, and in one case in the umbilical region. These are the cases in which, prior to the perforation of the ulcer, adhesion takes place, excluding the peritoneal cavity, followed by the formation of a mural tubercular abscess. In more than one case the tubercular nature of the abscess and its intestinal origin were predicted before the abscess was opened. A fecal fistula is sure to follow the opening of such an abscess. The granulations



Peritoneal tubercle showing bacilli. A, visceral peritoneum. Eye piece 4, obj. 1/12.

lining the abscess cavity may for a time prevent the escape of intestinal contents, but in the course of a few days or weeks the granulations give way and the fecal fistula appears. If the disease is attended by plastic peritonitis to any considerable extent the inflammatory exudate may often be distinctly outlined by palpation.

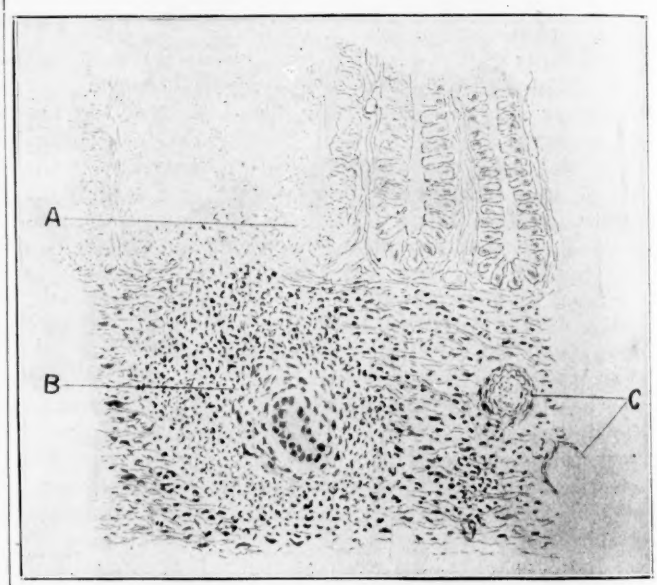
Voehts calls attention to a condition of diagnostic value, often met with in such cases, in the form of indurated plates in the peritoneum of almost cartilaginous hardness.

Such areas of induration are not only found in the ileo-cecal region, along the course of the colon according to the seat of the disease, but also in Douglas' fossa. In the pelvis these indurations may grow to actual exudates of considerable size, which in women might be mistaken for diseased adherent ovaries or tubercular Fallopian tubes.

In four out of six cases operated upon by Czerny a diagnosis of probable intestinal tuberculosis was made before the operation was performed. The diagnosis was based largely upon the clinical history which indicated the existence of a cicatricial stenosis in the ileo-cecal region and the presence of a swelling, which on percussion yielded a dull tympanitic resonance, and which was movable and only slightly tender on pressure, and the periodic abdominal pains caused by exaggerated intestinal peristalsis, as described by Czerny, König and Benoit.

The anatomic location of the stricture is indicated by clinical phenomena which deserve a careful study and analysis. Stenosis of the duodenum above the entrance of the bile duct, gives rise to the same symptoms as stenosis of the pylorus, but below this point it is attended by symptoms which not only simulate the latter affection, but also obstruct the entrance of bile into the intestinal canal.

The most important condition which characterizes duodenal stenosis below the bile duct, is the constant presence of bile in the chyme and repeated ejections of the fluid by vomiting. On the other hand, of three clinical observations Boas ("Ueber die Stenose des Duodenum," *Deutsche med. Wochenschrift*, 1891, No. 28), shows that fluid taken from the stomach



Tubercular intestine. A, necrotic mucosa; B, tubercle in submucosa; C, vessels. High power.

contains not only bile but also pancreatic juice. The contents of the stomach possessed all of the chemic properties of duodenal chyme.

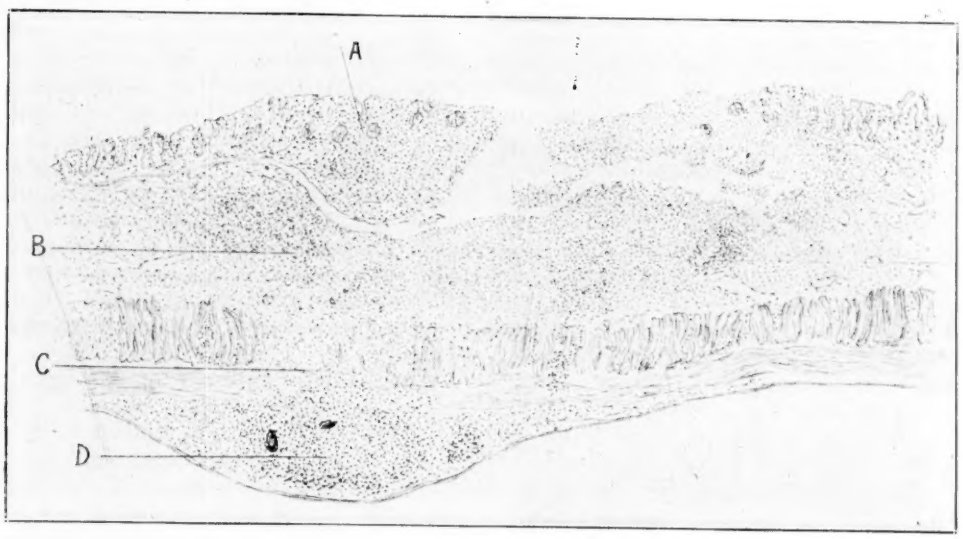
Duodenal differs from pyloric obstruction also by the absence of a corresponding dilatation of the stomach, by the absence of the products of fermentation of the stomach contents and by the absence of sarcinæ and yeast cells. No distinction can be made between obstruction in the lower portion of the duodenum and the upper part of the jejunum. Vomiting of large quantities of bile indicate duodenal obstruction, while the ejected material assumes more and more the character of feces, the lower the location of the obstruction. In eight out of twelve cases of duodenal obstruction, collected by Gerhardi and Hagenbach, the disease was due to carcinoma, cysts or hemorrhage of the pancreas. The search for the pancreatic juice in the stomach contents is important. The number of well authenticated cases of tuberculosis of the duodenum have been placed on record, and there is no reason to doubt that in isolated cases the ulceration might heal with the usual remote conditions following cicatricial stenosis and intestinal

obstruction. If the cicatricial stenosis involves the ileo-cecal region, or any part of the colon, the usual symptoms indicative of intestinal obstruction in these portions of the intestinal tract, will develop. Diarrhea is the most constant symptom in such cases. In far advanced cases extensive tympanites, fecal vomiting and complete interruption of the fecal circulation at the point of obstruction complete the clinical picture of intestinal obstruction.

Diagnosis.—The diagnosis of secondary tuberculosis of the intestines presents few difficulties if the primary disease is well marked, and affects an organ readily accessible to examination. Pulmonary phthisis generally precedes and attends secondary intestinal tuberculosis. In women, tuberculosis of the internal genital organs occasionally constitutes the primary affection, and extension takes place to the intestinal canal, either through the lymphatic channels or, as in one of Czerny's cases, by rupture of a tubercular abscess into the intestinal canal. In cases of primary intestinal tuberculosis, an early correct diagnosis is seldom made. There are other ulcerative affections of the intestines which in many respects resemble intestinal tuberculosis. Councilman ("Johns Hopkins Hospital Reports," March, 1892) reports a case of extensive and deep ulceration of the lower portion of the ileum complicated by stricture of the rectum, which terminated in death from perforation and gangrenous periproctitis, and in which typhoid fever and tuberculosis could be safely excluded as causes. At the postmortem, ulceration of the ileum was found, with invasion of the tissues by colon bacilli. Some of the ulcers presented the appearance of an acute process, others were of a chronic nature. Numerous bacteria, both short rods and micrococci, were found in the superficial necrosed tissue, in some places extending into the cellular infiltration in the submucosa. These microbes did not seem to stand in any direct etiologic connection with the pathologic changes. The writer recently had under his observation for several months a case of chronic diarrhea, which had resisted all remedial measures. The patient was a man about 30 years of age, very anemic and greatly emaciated. No hereditary tendency to tuberculosis, and no cause could be ascertained, which might have produced the chronic intestinal catarrh. Examination of the lungs and other important organs failed to locate a tubercular focus. The mesenteric glands could not be felt on palpation and rectal examination. The stools were frequent and liquid. The pain slight and referred to the umbilical and hypogastric regions.

Intestinal tuberculosis was suspected. Carbonate of guaiacol and salicylate of bismuth were administered internally and the colon was washed out daily with a copious enema of warm salt solution. On many different occasions the stools were examined for tubercle bacilli, but none could be found. Myriads of colon bacilli and micrococci were invariably found. The absence of tubercle bacilli in the stools and the marked improvement which followed the treatment, leave but little doubt that this was a case of intestinal ulceration, caused by infection with the colon bacillus.

Bacteriologic examination of the feces in suspected cases of intestinal tuberculosis should never be neglected, as it often furnishes positive proof of the tubercular nature of the disease. Tubercle bacilli, when present in the feces, in which they may be demonstrated by the same methods as in sputum, are indicative of intestinal tuberculosis, providing that they are observed upon repeated examination, and that clinical symptoms are present which point to the intestines as the seat of disease, as otherwise they may be referable to swallowed sputa.



Tubercular intestine. Low power. Cross section of ulcer. A, necrotic mucosa; B, tubercles in submucosa; C, invasion of muscular layers; D, peritoneal tubercle with giant cells.

The best way to find the bacillus is to dilute the feces with distilled water and to prepare and strain the deposit after centrifugation. Sawyer (*Medical News*, May 23, 1896) urges the importance, in cases of suspected intestinal tuberculosis, of examining the mucus collected from the rectum, just above the sphincter ani, for bacilli. When found, particularly on the surface of fissured stools, these clusters of bacilli are of diagnostic value, and may be relied on to indicate tubercular processes in the intestinal tract. He has thus found them in several cases when they could not be found in the sputum, or when sputum could not be obtained.

If the tubercular enteritis has progressed to the formation of cicatricial strictures, the differential diagnosis between intestinal obstruction from this cause and other inflammatory affections which result

in ulceration and cicatricial stenosis, is always difficult and sometimes impossible. In such cases a probable diagnosis must rest on a careful study of the clinical history and search for tubercular foci in other organs.

Congenital stricture.—Congenital stenosis of the intestinal canal may appear as a single or multiple congenital defect, may affect any portion of the intestinal canal and may cause no symptoms until long after birth Intestinal stricture occurring in infants, children and young adults, without any history of the existence of an antecedent ulcerative lesion, is quite frequently of a congenital origin.

Traumatic stricture.—If in cases of intestinal obstruction from a stricture the clinical history shows that the patient has been for some time in the past, the subject of an injury to the abdomen it should be borne in mind that the stricture may be the direct result of the trauma. Such strictures are occasionally caused by a blow on the abdomen. Mygiud reports such a case. Intestinal resection was performed six months after the accident for symptoms of obstruction, and the patient recovered.

Traumatic strictures may result from laceration of the mucosa or from plastic peritonitis. In the former variety the lesion of the mucous membrane would be likely to simulate more closely tubercular enteritis than the peritonitis form. In both instances, however, the catarrhal enteritis complicating the chronic obstruction would present some clinical features in common with tubercular enteritis.

Stricture following strangulated hernia.—It has been known for a number of years that intestinal stricture occasionally develops after the reduction of a hernia by taxis or operation. The stricture in such cases is caused by a circular necrosis of the mucous membrane, resulting from the pressure by the strangulation. The elimination of the necrosed tissue is followed by ulceration, and the healing of the circular ulcer finally leads to cicatricial contraction and intestinal stenosis. Garré first described intestinal stricture as one of the remote results of a strangulated hernia. ("Ueber eine eigenartige Form von Darmstenose nach Brucheinklemmung." *Beiträge zur klin. Chirurgie*, B. ix.) He made the observation that in some cases of strangulated hernia the mucous membrane of the bowel at the point of constriction becomes necrotic and is cast off as a slough. The circular defect heals by granulation, and the resulting scar leads to circular constriction.

In his first case the symptoms of obstruction necessitated a laparotomy, which was performed nine weeks after the herniotomy. The patient was 27 years old, and the subject of a preperitoneal inguinal hernia. Intestinal resection to the extent of forty-one centimeters was made, and the continuity of the bowel restored by circular enterorrhaphy. The patient recovered. Examination of the specimen removed showed that the ulcerated surface had not entirely healed. At one point the ulceration extended as far as the peritoneum.

Ravult ("Rétrécissement cicatriciel de l'intestin au niveau des 2 points de l'étranglement d'une ancienne hernie," *Bull. de la Soc. anat. de Paris*, 5, Série iv) reports a case of double cicatricial stricture of the small intestine which caused death from acute intestinal obstruction. Several years before the last illness the patient was operated upon successfully for strangulated hernia. The acute attack of intestinal obstruction resulted fatally in a few days. The necropsy revealed two strictures eight centimeters apart; the segment of bowel between them was distended by gas. Above the stricture on the proximal side the bowel was greatly distended and vascular, while the intestine below the second stricture was contracted, empty and pale. The strictures were undoubtedly the result of sloughing, ulceration and scar formation, consecutive pathologic conditions caused by harmful circular constriction by the neck of the hernial sac.

The time of the appearance of symptoms of obstruction in this form of intestinal stenosis varies from a few days to a year or more. Pitt records a case of femoral hernia in which symptoms of obstruction appeared five days after the reduction of the strangulated hernia, while in Garré's case the symptoms of obstruction did not set in until nine weeks after the relief of the strangulation by taxis.

The possibility of the existence of a cicatricial stricture due to such a cause must be remembered in cases of intestinal obstruction in which the clinical history refers to strangulated hernia relieved either by taxis or operation.

Stricture following healing of typhoid ulcer.—The healing of typhoid ulcers is very rarely followed by cicatricial stenosis. Treves made a very careful search for stricture of the intestine caused by typhoid ulcer and was able to find only one well authenticated case. Typhoid ulcers, as a rule, heal rapidly and much of the tissue destroyed is reproduced by the reparative process, leaving only a minimum quantity of connective tissue, while the healing of a tubercular ulcer is attended by the formation of an abundance of connective tissue, which subsequently undergoes progressive cicatricial contraction. The locations for the stricture are the same in typhoid and tubercular ulcers.

Syphilitic stricture.—Among the multiform visceral lesions caused by tertiary syphilis are to be noted intestinal strictures. According to Rieder ("Annual of Universal Medical Sciences," Vol. 1, D. 31) the lesions causing the obstruction are most frequently met with in the upper part of the small intestine. Syphilitic stricture is not caused by ulceration but by the production of new connective tissue in the submucosa and later in the other coats. The symptoms attending syphilitic intestinal stricture indicate the existence of a mechanical obstruction without the existence of a previous ulceration, as is the case in tubercular stricture.

Ovarian tumor.—The differential diagnosis between a tubercular stricture and intestinal obstruction caused by certain anatomico-pathologic forms of ovarian tumor is attended by many difficulties. In one of Czerny's cases of ileo-cecal tuberculosis, the swelling was mistaken for an ovarian tumor by the attending physician. Veit has shown that in women the differential dignosis between tuberculosis of the ileo-cecal portion of the intestinal tract and ovarian tumor which has extended to the meso-cecum and meso-colon is always extremely difficult and often impossible.

Malignant stricture.—The two causes which give rise to intestinal obstructions most likely to be mistaken for each other, are cicatricial stenosis following tubercular ulcer and malignant stricture. The ileo-cecal region is the favorite locality for both of these affections. In intestinal obstruction due to either of these causes the clinical history is characterized by a

complexus of symptoms pointing to chronic obstruction, and in either case involvement of the mesenteric and retroperitoneal lymphatic glands is sure to occur sooner or later. Tubercular strictures are found most frequently in persons below middle age, while carcinoma is more likely to occur in persons of advanced age. The reverse may, however, be the case, as intestinal tuberculosis may attack the aged and intestinal carcinoma may occur in young adults. The detection of a tubercular focus in another organ, and the discovery of tubercle bacilli in the stools will furnish evidences of the tubercular nature of the obstructive lesion and will exclude the probability of the existence of malignant disease.

ORIGINAL ARTICLES.

PATHOLOGY OF TUBERCULOUS GLANDS OF THE NECK; THEIR EARLY AND COMPLETE REMOVAL.

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That form of adenitis so frequent during adolescence and middle age, wherein tubercle bacilli invade the lymphatic glands of the neck, is one of the most important pathologic conditions which come to the observation of the surgeon. The infection of tuberculosis, and its local development in the lymphatic glands of the neck, naturally presents the strongest grounds for fearing the dissemination of the infection to other and more important structures in the body. These enlarged glands may retain their hyperperplasia a varying length of time, but during this time the toxins generated on the spot are absorbed to the detriment and weakening of various structures in the body. The subsequent acute infection, due to streptococci, invades the tuberculous gland, transforming it into an acute abscess, which sometimes brings a spontaneous termination of the tuberculous development. This lymph-adenitis may be limited to some of the superficial or may exist in the deeper lymphatic glands of the neck. The glands grow to the size of a walnut, a group of which would produce a tumor of varying dimensions, but sufficient, by size and compression of surrounding structures, to give through mechanical, aside from its pathologic effects, excessive trouble to the patient.

The superficial as well as the deep lymphatic glands are affected; of the superficial set the most frequently affected are the sub-maxillary lymphatic glands that are situated in the digastric triangle, beneath the body of the lower jaw, also the vertical set of superficial glands of the neck, four to six in number, known as a superficial cervical chain, which are situated chiefly in the posterior triangle of the neck, along the course of the external jugular vein, between the platysma and the deep fascia. The small superficial glands in front of the neck between the hyoid bone and the sternum, and posteriorly from the trapezius muscle are also affected. Among the deeper lymphatic glands of the neck invaded by tuberculosis, we find both the upper and lower set involved. The upper set extends along the course of the internal jugular vein from the base of the skull to the level of the thyroid cartilage. When these are involved adhesions join these glands to the surrounding structures, and considerable risk is involved in their separation from the deep jugular vein. The lower deep cervical glands follow the course of the internal jugular vein, from the thyroid cartilage to near the clavicle. These receive the lymphatics from the lower portion of the neck, and also from the esophagus and superficial cervical glands. Both the upper and lower set receive the efferent vessels from the lingual, internal maxillary and post pharyngeal glands, being deep lymphatic glands of the head; these receive their lymphatics from the tongue, mouth and nose. We here have direct anatomic reason for tracing these infections of the lymphatic glands of the neck, to the invasion of the lymphatic system by tubercle bacilli through the nose and mouth.

Granted the initial infection, it is easy to understand the resulting hyperplasia. The bacilli are found in the lymph channels between the acini of the glands and, developing there, they generate a toxin, which by its irritation causes a proliferation of the endothelial cells. There is likewise a proliferation of fibrous tissue in the stroma, but not commensurate with the growth of epithelial cells. This process generally starts about the center of the gland, and during the first stage presents a hyaline appearance; subsequently as the infected cells die away, these undergo caseation, or fatty degeneration. It is at this stage that the secondary infection of the streptococci may take place and result in the suppuration of the glands. If we analyze this process, we find a great analogy with the tuberculous process in the lungs, where a cheesy tubercle may occupy one or many trabeculæ, and subsequently suppurate under the infection of the germs of the atmosphere, producing an abscess cavity. Such an abscess about the neck often leads to further infection, and certainly lowers the vitality of the patient, predisposing him to other infections of deeper structures. Our modern views of infection of any kind points to the necessity of destroying foci of infection, and leads us to the conclusion that the tuberculous glands should be removed at as early a date as possible, provided they have not shown a tendency to subside under the ordinary treatment.

That a tuberculous process should be removed we have no doubt, and the manner of its destruction or removal is what we now propose to discuss.

Two great methods are in vogue to-day; one consists in exciting violent inflammation within the gland whereby the tuberculous process may be checked. This consists in the injection of an emulsion of iodoform in glycerin, or a solution of iodoform and ether. There is no doubt that in certain cases of inflammation of the superficial glands of the neck this treatment will conquer the disease, but cases are rare, and cure at best can never be gauged from the first. The inflammatory reaction may be very severe, and on subsiding may leave a further tuberculous condition. Again, the application of this treatment to the deeper lymphatic glands is fraught with danger from the possibility of injuring the deep jugular vein, the carotid artery, and other structures. At best, even if the process of tuberculosis stopped, a fibrous mass would be the result, retaining in a measure the appearance of a fibrous growth, and not constituting at any time a perfect cure. We do not mean to condemn the treatment, but do believe that it is not a direct means of fulfilling the indications in the case.

We have always advocated the complete dissection and removal of these tuberculous glands, believing that the sooner such foci of disease are removed the better. The patient can convalesce and regain health under the influence of general tonic and hygienic treatment.

In every case which presents itself we try to locate the anatomic relation of the glands to the surrounding tissue, and direct our efforts accordingly toward dissecting out all of the infected glands. It would be useless to describe the care with which dissection should be made in view of the liability to wound the jugular vein; suffice it to say that throughout this delicate work great care should always be taken to see the work as it progresses. Adhesions are such, at times, that it is impossible to distinguish the outlines of the gland from the surrounding tissue, which might have gathered within itself some important deep structure. Of material help for the safe dissection of these growths is the use of curved scissors, which, by keeping their concavity upon the growth, gives us the greatest safeguard against cutting outside of the growth. Should, unfortunately, the jugular vein be wounded, it is our practice to clamp it, and to allow the clamp to remain *in situ* twenty-four hours. In every instance we packed the wound with iodoform gauze until granulations covered the wound. Patients always stand the operation well and seem to improve in general health rapidly.

The main contra-indication to the operation is the presence of tubercular disease in the lungs. I believe it not good practice to remove tuberculous glands of the neck under these circumstances, for it seems that after the operation the lung trouble takes on redoubled activity in its development. It would seem that the removal of one would concentrate the whole development of the trouble in the remaining focus. With this exception we advise the complete eradication of tuberculous glands. Having followed this practice for many years and having observed in various hospitals, and in private work, over 200 cases, submitted to operation, we believe that this treatment is most in accord with the modern development of bacteriology and surgery.

It is not easy to make a differential diagnosis of tuberculous adenitis from the various growths that invade this locality. For a long time tuberculous lymph-adenitis was known as scrofula. To Koch belongs the credit of establishing these growths as a mere form of tuberculosis.

The conditions likely to be mistaken for tuberculous adenitis would be, malignant lymphoma, known as Hodgkin's disease. In this condition there is a general enlargement of the glands around the neck, and possibly in other portions of the body also, for it is a local manifestation of a pseudo-leukemia. The patient is extremely pale and other structures may be involved. Tuberculous adenitis should be differentiated from a lympho-sarcoma, and secondary metastatic lymphoma, both of which are malignant and can be recognized as such from the rapidity of their development and invasion of surrounding tissues. Syphilis also manifests itself in the glands of the neck, but the process is slow and would involve a greater number of glands of both sides at the same time. Tuberculous glands on the contrary are likely to be limited in number, although they sometimes appear on both sides of the neck simultaneously. The growth is rather slow. At first the gland seems movable, but as it develops it appears more and more fixed. It is not necessarily accompanied by great pallor, nor does it cause much pain. In fact, in the history of many cases, these tumors retain a certain size for months, without showing any change, and without appearing to give the patient much trouble, except in the gradual weakening effect which they bring on to the general system.

The prognosis in uncomplicated cases of tuberculous adenitis is favorable. Patients improve rapidly in general health and maintain this improvement. In but a small proportion of cases do we see a new development of tuberculosis in the glands of the neck after the operation.

As far as deformity incident to the operation is concerned, should the surgeon exercise an ordinary amount of care the result will not be ungainly. We can often apply a subcutaneous suture which will bring the surface epithelium in absolute apposition, and leave but a very small trace of the operation. When this is compared with the ugly and distorted scars which result from only having allowed these glands to suppurate, there is no doubt that, considering the cosmetic result, the advantage lies altogether in the clean excision of the gland, with an accurate approximation of the lips of the wound. As a rule the wound can be maintained in an aseptic condition, and no pain is experienced at any time after the operation—an element which should commend itself to all those afflicted with this condition. I have no hesitation in advising the operation under all circumstances to young or old, believing it to be the safest way to remove this tendency to further tubercular infection, supplementing this procedure by the ordinary hygienic and tonic measures.

DISPOSAL OF THE STUMP IN APPENDICITIS OPERATIONS.

Read at the Tenth Annual Meeting of the Southern Surgical and Gynecological Association held in St. Louis, Nov. 10-13, 1897.

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No achievement so fittingly typifies the triumphs of the last decade as does the mastery of the most important surgical lesion in the abdomen—inflammation of the vermiform appendix. In 1886–7 Fitz, Sands and Weir made the epoch-making contributions to the diseases of the right iliac fossa that lifted them from the doubt of misconceived pathology and placed them in the pale of surgical resource. In 1889, McBurney completed the last link in the chain of its natural history by recognizing the necessity for prompt surgical interference and advocating its more general practice. Since then every shade of opinion in the spectrum of logic has been entertained. No subject has ever so engrossed the energy of surgeons whose individual experiences have been so keenly scrutinized, and yet whose results have been so positive and convincing. This subject can not be trite on account of its great seriousness. The contributions to its literature make a niche in surgical history replete with continuous endeavor and adorned with unprecedented success. I preface the consideration of one practical phase of the subject by the recapitulation of some facts which

constitute our beliefs. Appendicitis is pre-eminently a surgical lesion. The moment the diagnosis is made, it should become the object of the closest surveillance. In its diagnosis, surgical opinion as to its accuracy, by one who is familiar with its manifestations, is paramount. It was said of the lamented Agnew that in his intimate knowledge of anatomy, the integument to him was transparent. In diseases of the appendix its possibilities are so erratic that the most expert may not be able to accurately estimate its extent, but diagnosticians trained in its observation may recognize its presence with precision and certify its dangers. I believe in the teaching of Morris, that an infected appendix should be isolated surgically as an infectious disease is isolated hygienically. An infected appendix will extend to other tissues—infectious diseases will extend to other individuals. That many cases of appendicitis will recover without operation will not be controverted, but it is a task of the utmost discrimination and the gravest responsibility to attempt to designate such cases. One can never say with assurance which case may get well and which case may rapidly get worse and demand operation so imperatively that they would die without it. This is the type of cases that if delayed die with it.

Mayo Robson says: "Immediate operation as soon as the diagnosis is made, as originally advocated by McBurney, is better than individualizing or operating when it seems necessary." When it seems necessary, is synonymous with wide-spread infection. Willy Meyer asserts that "in 100 cases treated by immediate operation as soon as a probable diagnosis is made, more cases will be saved than out of an equal number of cases operated when it seems necessary."

An attempt at refinement in the operative indications may be thus summarized: Acute onset, with rapid pulse and considerable localized tenderness requires immediate operation; where a more gradual commencement, pulse under 100, and the early appearance of tumor, may more safely wait for the formation of competent adhesions and subsequent simple evacuation of abscess. Progressive increase of pulse rate, temperature and tenderness, makes early operative intervention imperative, while a gradual subsidence of these signs postpones such measures.

Distended abdomen, vomiting and rapid pulse signalizes extension or general peritonitis. While these cases require the most desperate surgery, Robson has saved five out of six cases of general peritonitis, and many American surgeons have rescued cases where pus ran out on both sides of the table. In chronic relapsing or recurring appendicitis the indications are most postive. It is almost the universal consensus that after one attack (Meyer) or more than one well-marked attack (McBurney) operation should be done, to anticipate another. While an individual may have one, two or four mild attacks, any of these or the next may be so serious as to jeopardize life and make an operation so imperative and under such critical conditions that it will do little else than accentuate the danger of delay and the necessity for operation in the interval after one frank attack.

In the pioneer days of appendicitis work, when the operation was only undertaken in the presence of suppuration, the appendix was entirely gone or was not sought for. Indeed the question of prolonged search and removal of the appendix in abscess cases is one of the few remaining moot questions in its treatment and has to be answered by the individual convictions of the operator.

Since surgeons have assumed the responsibility of doing operations for appendicitis that are surgically safe and less dangerous than an ordinary attack left to itself or treated medically, it behooves them to perfect every detail in the operative technique to the end that they do not mix danger with beneficence. The principal step in this operation that makes it distinctive is the disposal of the stump after amputation of the appendix.

In the early deliberate operations for the removal of the appendix surgeons were content to ligate it as they would an artery. The protruding mucous membrane of the stump was cauterized with carbolic acid, the Paquelin cautery or a bichlorid tablet. Unlike the ligation of an artery, instead of the sterile fluid that organizes behind the constriction, the fluids or contents of the appendix are constantly saturated with numerous species of virulent micro-organisms that find an admirable pabulum in the compressed area under the ligature. This method was supposed to have its analogy in the ligation of the pedicle of an ovarian tumor, but we know now that it is wholly different from tying an aseptic stump for hemostasis. It likewise finds no analogy in the ligation, for ablation of the appendages, which have no connection with the intestines, can not be inverted and are usually sterile or are capable of being made so. Moreover, Morris has compared ligation of the appendix to ligation of the end of the colon after lateral anastomosis. They are structurally similar, and what would be unsafe in one would be unsound in the other. Approximation of the serous coats in both is the logical procedure. Subsequent perforation after simple ligation occurred sufficiently often to cause abandonment of that method. The custom of inverting the stump into the caput coli superceded the original crude device of dropping the pedicle. This has also many modifications and is the accepted way of disposing of the stump. It was characterized by Price, early in the history of its adoption, as "the good way." It is practiced in varying completeness from simple invagination into the cecum, to the elaborate technique of Van Hook, which consists in amputating the appendix between a temporary ligature around the base of the appendix and artery forceps, distally. The stump is cauterized with carbolic acid and a row of Lembert sutures is passed from side to side, the temporary ligature of appendix being removed before the sutures which invaginate the appendix are tied.

Dawbarn introduced the neat and efficient purse-string suture. It encircles the base of the appendix within a radius of a quarter of an inch, passing through the serous and muscular coat of the cecum. The appendix is cut away about a half an inch from its junction, stretched with small forceps, which push it into the intestine and are withdrawn as the suture is tightened around the vanishing stump. The acme of refinement in appendix surgery was reached when the method of section through the peritoneal coat, excision of mucous membrane, and suture of opposing serous and muscular coats came into vogue. This method may or may not be combined with invagination. Personal modifications of this plan have given the brilliant results of Murphy and Morris, and in the hands of the expert, leaves nothing to be desired.

The cautery method minimizes the danger of infection from the stump, and is the one which McBurney commonly employs. The appendix, after its detach-

ment from its mesentery, is amputated a quarter of an inch from its base. The edge is held up with forceps, a probe passed through the opening of the stump of the colon, to test its permeability, and a fine Paquelin cautery point inserted into the lumen of the stump. The ligature is then applied around this cauterized area, the ragged edge trimmed and freshly cauterized.

The proverbial untrustworthiness of a thermo-cautery has ever been the *bête noire* of the practical surgeon, and any method which includes its employment is not congenial.

Some of the failures from inversion of the stump, which caused consecutive perforation, fecal fistula, and sometimes death, in operations of otherwise favorable import, were due to a stricture-dam between the ligature and proximal opening of the appendix. This condition manifestly duplicates the essential condition for a continuance of all the possibilities for evil of the original attack. The operation was imperfect—a mere resection of the disease, leaving the actual and active causal factor uncanceled. These facts have led McBurney to test the patency of the lumen of the stump with a fine probe after amputation and before ligature and closure. When leaving a stump this should invariably be done.

The ideal of all surgery is completeness, and applied to the surgery of the appendix would suggest total excision of the entire organ. This ideal method has been approached by McBurney in his recommendation to "cut away the appendix very close to the colon, and that portion of the wall of the colon which includes the orifice should be depressed with a probe and the edges of the furrow thus made sutured with a double row of fine catgut or silk."

In spontaneous amputation of the appendix by necrosis near its base, I have seen this method practised with success. The efficiency of peritoneal suture of gunshot or stab wounds of the intestines no doubt suggested to many surgeons a similar closure of the orifice in the cecum left after complete excision of the appendix. It has remained for Deaver to practice this method, as a routine, in suitable cases, and in its more general adoption I believe will consist the last step in the evolution of the treatment of the stump. The technique, as employed by Deaver is as follows: After freeing the appendix from adhesions and mesappendix, the cecum is stripped of its contents and grasped between the fingers and thumb of the left hand; the appendix being held up with forceps by an assistant, is cut off flush with colon. The rent at the site of its former junction is united by continuous Lembert sutures, just as in a gunshot or stab wound of intestines, while the cecum is still held securely with the left hand. They may be disposed in two layers, the first uniting the edges of the wound, the second approximating the peritoneal covering of the cecum over it.

This method aside from its completeness, is particularly useful when the appendix is densely adherent throughout its length. A temporary ligature to the distal side allows of division at its base, and disposal of the proximal end at once. Subsequent detachment of the organ itself from base to apex can be accomplished with great facility. This method is not applicable to all cases. When the cecum is tied down by adhesions, it is impossible to bring it into the incision, which is the essential requisite in preventing the escape of any of its contents, and necessary to the careful suturing of the cut end. Where the appendix has its origin behind the cecum, the carrying out of this technique would expose the patient to the danger of infection. Total excision of the appendix and closure of the hole in the head of the colon, does away with the following dangers: 1, subsequent perforation of the stump under the ligature from infection in its own cavity; 2, abscess of the wall of the cecum from invagination of an infected stump; 3, continuance of the infectious process from a stricture dam in the stump between distal ligature and proximal opening of appendix into cecum; 4, imperfect invagination with incomplete drainage of the stump, on account of cecal wall being thickened and stiffened with inflammatory exudate; 5, infection in base of appendix, not apparent macroscopically.

I have employed this method in five cases in the last few months, with entire satisfaction.

Case 1.—Mr. A. S., salesman, was stricken with acute pain Saturday morning, Feb. 15, 1897. Sunday noon pulse was 120, temperature 100, with rigidity of right abdominal wall and great tenderness. Operation within the hour disclosed partial sloughing of the appendix at the base. It was encased in a layer of lymph that could be stripped off like an umbrella case. The remaining attachment to colon was severed, and the edge trimmed and united by two rows of Lembert sutures, gauze drainage, recovery.

Case 2.—Joe L., aged 9, woke with pain in right iliac fossa, vomiting, diarrhea. Household remedies for colic were given. Next afternoon he was seen by Dr. T. P. Crutcher. Temperature and slight tenderness continued. Third day noticed pain in right iliac region, on attempting to run out to see a passing fire engine. Fifth day he was brought to my office, pulse 120, temperature 102, pain at McBurney's point marked, limped and inclined to right side on walking. Morning of operation on sixth day, temperature was 99, pulse 88; pressure in opposite flank occasioned pain in appendical region. McBurney's criss-cross incision was made. Appendix was ulcerated through in center and enclosed in small pocket of sero-pus. Gauze protective pads were applied. Appendix was amputated between ligatures below perforation, mesappendix ligated with silk, stump excised; cecum was closed with Lembert sutures; Morris gauze in gutta-percha drainage wick was placed at lower angle. Incision was closed in layers with chromicized catgut. Recovery was unnoteworthy, save for tardy closing of drainage sinus. Silk ligature was discharged through small persisting sinus seven weeks after operation; rapid healing ensued.

Case 3.—J. D., physician, age 42, had first attack twelve years ago, four attacks since; the last one two months before operation. Three or four days before the operation he had another attack, which reached its acme just prior to operation. Temperature ranged between 102 and 103, pulse 115 to 120. He has had noticeable tenderness since the first attack, greatly aggravated in the last attack. I assisted Prof. Paul F. Eve in the operation.

Through long incision, a large mass was found in the iliac fossa, which enclosed an abscess cavity ruptured during manipulation. Adhesions were separated, and appendix as large as a little finger was isolated. It was amputated at junction with colon, and resulting rent closed, gauze drainage through and through suture, uneventful recovery.

Case 4.—Mrs. R., age 22, had tenderness in appendix region discovered in pelvic examination, during treatment for movable retroversion. I advised rest and composure. She was seized with nausea on the way home, and sat down on the pavement and vomited. Two hours afterward tenderness was more marked, nausea continuing; pulse 68, temperature 99 3. Mercurials were given, followed by salines next morning, at which time pulse was 66 and temperature 100. In consultation Dr. McCampbell related a mild attack in February, 1897. Operation was performed twenty-six hours after onset of symptoms, July, 1897, McBurney incision. Appendix was thickened, stiffened, inflamed and adherent at tip. It was amputated at base; Lembert closure of cecal opening; layer approximation of incision. Highest pulse was 76, never required purgative; union without redness. She sat up on eleventh day; discharged within two weeks.

Case 5.—J. R. P., age 28, traveling man, had a mild attack, February, 1897; was not confined to bed; could not ride in a buggy without painful jarring of "sore spot" in right iliac region; has had numerous slight attacks since. Oct. 23, 1897,

after a hunt, he had a chill, followed by fever, and attended with old pain in right side; third night prevented sleep. The fourth night temperature reached 102, following the chill in the afternoon, pulse 90, history of daily chills and fever. The appendix could be easily palpated, and was not very tender.

Malaria, with chronic appendicitis was diagnosed; 0.97 gram of quinin six hours before expected chill had no effect. On the fifth night, after chill in the afternoon, temperature rose to 103, pulse 102. Appendix was well-marked, slightly more tender. Operation delayed twelve hours for the arrival of his physician, Dr. Curtis of McKenzie, Tenn. Operation Oct. 30, 1897. Two inch criss cross incision was made. Appendix was found thickened, and apex much enlarged. Amputation-exsec tion, method used with Lembert suture, layer closure and no drainage. He had a chill the first day, followed by a temperature of 103; quinin has prevented chills since, but the afternoon temperature ranges between 100 and 101, pulse from 80 to 90. Skin sutures were removed on seventh day, perfect union, no tenderness.

The following case, occurring since the paper was read, is reported as an illustration of posterior implantation of appendix, and the impracticability of carrying out the technique devised by Deaver in such cases.

Case 6.—E. G. A., student, age 18 years; in perfect health. Was attacked with pain in right iliac fossa, preceded by slight chill on the evening of Dec. 1, 1897. He was in bed next day and up the next, but had a chill and some uneasiness the third day that confined him to bed. Same night he had a very severe attack of pain, with high temperature, tenderness of the appendix region and increased pulse. Mercurials and salines were administered and hot compresses applied until the morning of December 8. After a night of considerable and continuous pain, his temperature rose to 102, pulse 126. I saw him at noon when there was very great tenderness, which was more acute near the iliac spine and in the lumbar region than at McBurney's point. Urinary suppurative conditions were excluded clinically. Temperature 102.6, pulse 128. Immediate operation advised, but was delayed until night, when he was moved to the Infirmary at 10 P.M. Before operation, temperature was 103.2, pulse 134. Free oblique incision was made. Anticipating the presence of pus, a coffer dam of gauze was carefully and completely arranged to wall off the intestines entirely. The head of the colon was found lying over a large mass, which was deliberately opened, as the danger of peritoneal contamination had been adequately provided against. A quantity of dark, thick ill smelling fluid exuded, which was instantly mopped away as it appeared. Free irrigation was made with normal salt solution. The appendix was then found under and glued to the posterior wall of the cecum. It was dissected away with ligature and scissors. A perforation was found about an inch from the cecum. The point of attachment to the colon could not be drawn into the wound for complete excision and suture, and hence was simply ligated. Peroxid irrigation of sac was followed by normal salt solution; gauze drainage was introduced; silk worm gut closure was made. Temperature dropped three degrees, and the pulse twenty-eight beats by morning. The gauze was pulled out a trifle to facilitate drainage which was not very profuee. At the end of twenty-four hours the temperature had risen again to 102.8 and the pulse from 112 to 134. All the gauze drainage was removed and the cavity irrigated with normal salt solution through a glass catheter and gravity tube. The temperature steadily went down to 100 by the morning of the second day, and the pulse to 110. The bowels moved well on the third day, and the temperature went to normal and the pulse to 90. The drainage wick was removed, and the walled-in space irrigated daily and drainage replaced.

On the fifth day fecal matter was detected in the dressings, a chill followed, temperature rose to 101, pulse to 130. It was believed that the cavity was effectually walled off, but the small drainage opening was not deemed sufficient for safety and the entire wound was opened and irrigated and packed twice daily afterward. The temperature remained between 100 and 101 until the eighth day, when it touched normal. Pulse meanwhile ranged between 114 and 138. The temperature continued to rise irregularly with an exacerbation to 102.2 on the eleventh day and vacillated from 1 to 2 degrees until the fecal discharge ceased on the twenty-eighth day, when it subsided to normal permanently. A small sinus persists at the end of the eleventh week.

Let us have a Department of Public Health.

SOME UNUSUAL CASES OF APPENDICITIS.

A paper read before the Columbus Academy of Medicine, Oct. 18, 1897.

BY J. F. BALDWIN, M.D.

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After a surgeon has attended several hundred cases of appendicitis; after he has found the appendix on the left side of the abdomen, running up to the gall-bladder in front and to the kidney behind the colon, and even, as in a specimen in the museum of the Ohio Medical University, nicely curled up under the left collar bone; and after he has seen it discharging the abscess, resulting from its perforation, into the bowel, the bladder, the vagina, the groin, the scrotum, the lumbar region, and even perforating the diaphragm and discharging through the lung, he begins to feel a great deal of respect for this otherwise insignificant organ, and perhaps thinks that he knows a great deal about appendicitis. Nevertheless, even with such an experience, he will be constantly meeting with cases that will surprise him, and which will continue to still further convince him that the appendix, whether functionating physiologically, if it ever does so functionate, or inflamed and forming the nidus of all imaginable pathogenic microbes, or the harmless subject of debate in a medical society, is governed by no ordinary laws.

Within the last few months the writer has seen several cases of appendicitis, out of quite a number requiring operation, that presented such peculiar features as to justify their report.

Case 1.—Feb. 12, 1897, I was consulted by Mrs. H. C. Patient was aged 28 years, though looking much older, married eleven years, mother of four children, the youngest 2 years of age. Family history was negative, except that her father and mother both had some slight stomach trouble. One maternal aunt is supposed to have died of cancer of the stomach, or ulceration, at 60 years of age. Patient has had stomach trouble for at least eight years. Pain comes on immediately after eating, and continues until time for the next meal. In fact, the distress is almost continuous. Has no vomiting, no belching. Is troubled with some accumulation of gas in the bowels. Even a glass of malted milk taken at meal time will cause pain until the next meal. The pain is about the same day and night. Diet seems to produce little or no effect. Is usually constipated. Did not try to nurse her last child, owing to her ill health. Has received no benefit from any medicine which she has taken, although she has taken large amounts and in great variety. Has suffered more during the last two years, during which time she says she has lost about fifty pounds in weight.

On careful palpation I can detect a little tenderness at McBurney's point, and close questioning elicits the fact that at the very beginning of her stomach trouble she had an attack of pain and soreness low down on the right side. She was at that time unable to straighten up or move her leg without pain. On cross-questioning she is very positive that this localized trouble preceded the disturbance in her stomach. By palpation the thickened appendix can be quite distinctly mapped out. The patient was operated on February 20. Under an anesthetic the appendix was very easily outlined. On opening the abdomen the appendix was found very long, the distal extremity clubbed and thickened, with quite numerous adhesions, but none of them particularly dense. The appendix was removed in the usual way, and convalescence was entirely uneventful. Since her return home the patient has enjoyed excellent health. I have heard from her several times and her recovery has been complete.

There is no doubt that many cases of chronic indigestion are due to chronic catarrhal appendicitis, with or without adhesions. The above is quite typical, probably, of this class of cases. It would doubtless be wise to regard no examination of a dyspeptic patient as complete until the condition of the appendix has been carefully inquired into.

Case 2.—July 7, 1897, Mrs. P. K., aged 60, was seen. She

was the mother of eleven children, the youngest aged 14 years, and had always enjoyed excellent health. From her physician I learned that he had been called to see her on the evening of the preceding day. She had been sick for about ten days. Being constipated she had taken, June 27, a dose of salts. This was followed in a couple of hours by several loose movements of the bowels, accompanied by considerable pain. This pain was referred to no particular region, but was general. Later in the evening she vomited, and during the night sent for her family physician. A diagnosis of acute indigestion was made and an anodyne administered. She rested comfortably until toward morning, when the pains grew worse, being now referred to the epigastrium. She vomited several times and thought she had fever. On Tuesday, in addition to the opiate, she was given some digestive ferment and again seemed better. She rested well during the following night, though she still had some pain, but got out of bed the following morning and was able to be around until the following Sunday, when she again had an attack of vomiting. This persisted all day Monday, with some fever and more pain. Her condition continued about the same until Tuesday evening, when Dr. Cooperrider was sent for. He found her evidently seriously sick. Her legs were drawn up, countenance pinched, expression anxious, tongue dry and coated, bowels constipated, pulse 100, temperature 102. On examination of the abdomen he discovered a large, smooth, globular mass in the right iliac region. The neighborhood of the tumor seemed markedly tender, although she was at that time complaining of no special pain in this region. The muscles were rigid. Calomel and soda were prescribed to unload the bowels, and these had been freely opened when I saw her on the following day.

I found the abdomen distended, with the smooth, rounded tumor present as above indicated. The abdominal walls were quite thick, but the tumor could be pushed up to the liver, down into the pelvis, so that its lower border could be felt by the fingers in the vagina, and could be pushed beyond the median line to the left. The tumor was about the size of the two fists. First she assured us positively that she had had this tumor for several years and had supposed it was the result of having so many children.

With this history and examination, I made a presumptive diagnosis of an ovarian cyst with a long pedicle which had become twisted, with resulting peritonitis. The patient was sent to the hospital and operated upon the next morning. When under the anesthetic the outlines of the tumor could be more distinctly determined than before, and its mobility was marked. When pushed upward a band could be quite distinctly felt, seeming to come from the pelvis. It could be pushed across beyond the median line without difficulty. The diagnosis of ovarian cyst with twisted pedicle seemed to be strengthened by this examination. On opening the abdomen, however, the tumor was found to be made up of a mass of adherent intestines inclosing an appendiceal abscess. The meso-colon and mesentery were unsually long, which had permitted the wide excursions of the tumor. There were absolutely no parietal adhesions, but a general peritonitis was present. After carefully protecting the peritoneum by gauze sponges, the abscess was opened with the finger. As soon as the finger penetrated there was a hissing escape of gas, followed by a gush of foul pus. The cavity was carefully cleansed and an enterolith, about the size and shape of a date seed, removed; the cavity was sterilized with peroxid of hydrogen and corrosive sublimate solution. The appendix was then separated from its adhesions and removed in the usual way. The perforation was near the base of the appendix. Gauze was packed into the cavity and the abdomen thoroughly cleansed. Strips of gauze were used around the seat of operation, as well as to drain the abscess cavity. The patient stood the operation well, but the peritonitis, which had already developed, continued and death resulted in forty-eight hours.

I have stated this case to quite a number of my confrères, but not one of them has even hinted at a diagnosis of appendicitis. The possibility of appendicitis was discussed by Dr. Cooperrider and myself in arriving at a differential diagnosis, but was excluded owing to the mobility of the tumor and the history of its existence for several years. It is evident that the patient was mistaken as to the long-continuance of this tumor. It is probable that her increase in adipose had been mistaken by her for a tumor, and that she had not differentiated this from the tumor which we found.

Several surgeons have operated on cases supposed to be of appendicitis but have found ovarian cysts with twisted pedicle. I know of no operator, however, who has operated for ovarian cyst and found, as in this case, an appendiceal abscess. Yet with the history as given by the patient, I do not see how a correct diagnosis would have been possible.

Case 3.—July 12, 1897. Mrs. M. S., Mt. Vernon, Ohio, was seen in consultation with Drs. Russell and Larimore. The following history was obtained: Patient aged 40 years; mother of four children, no history of any preceding attack similar to this. Dr. Russell had known for several months that the patient had a lump in her right groin, which she told him was sometimes larger than at others. On Friday, patient was not feeling well and therefore took a large dose of salts. She had not been constipated, but felt that she needed a physic. She had four free movements of the bowels during the night, followed by colicky pains confined mostly to the region of the umbilicus. Dr. Russell saw her the next morning and prescribed a carminative mixture, which gave relief. Saturday night the pain became worse and diffused over the entire abdomen. For this he gave her a hypodermic injection of morphin. Sunday afternoon the abdomen became very tympanitic, temperature 101.5, pulse quite frequent and wiry. This condition continued until I saw her Monday noon. At this time her abdomen was enormously distended, her pulse weak, and general condition becoming rapidly desperate. The region of the appendix was not different from any other portion of the abdomen. The lump could be felt at the external ring of the right inguinal canal. This region was somewhat tender and there seemed to be a little impulse transmitted on coughing.

It was decided to make an exploration of this tumor in the inguinal canal. If a strangulated hernia should be found, this would be treated according to the indications; but if nothing were found there, then the abdomen should be opened to see what could be learned. The diagnosis of a general peritonitis was self-evident. The question was as to its causation.

Dr. Larimore proceeded to operate on the tumor in the groin. This proved to be a hydrocele of the round ligament and did not communicate with the peritoneal cavity.

Nothing having been found at this point to account for the peritonitis, I opened the abdomen. Owing to the doubt as to the cause of the peritonitis, the incision was made in the median line. On passing my fingers down toward the appendix they at once come in contact with free pus between the folds of the intestines. An incision was, therefore, made directly over the appendix, which was found gangrenous, and no attempt had apparently been made to hedge off the general peritoneal cavity by adhesions. The appendix was removed in the usual way and the abdomen cleansed as thoroughly as was possible in face of the enormous distension and the patient's desperate condition. Drainage was freely inserted, and the patient transferred to bed. Death occurred a few hours later.

Several years ago I opened an appendiceal abscess in operating on a large strangulated inguinal hernia in a very fleshy patient, but in that case the symptoms were entirely those of a local peritonitis in connection with the hernia. In this case the difficulty of diagnosis was thoroughly appreciated, and the course which was followed was adopted only after careful consideration, and is such as would probably be adopted by prudent surgeons invariably under similar circumstances.

Case 4.—July 19, A. F., aged 30, was seen. This attack had continued for about ten days, the patient having a temperature of from 100 to 102, with corresponding pulse, from the beginning. Purgatives had been given, which had acted, and morphin hypodermically as needed for pain. Patient presents a mass in the region of the appendix, though nearer the spine than usual. Abdomen is somewhat distended and quite tender. The mass is quite movable, so much so that the probable absence of adhesions was mentioned. Patient was operated on next day, at the Protestant Hospital. On making the usual incision I found no adhesions whatever in front, but a mass, evidently containing pus, between the folds of the mesentery and meso-colon. As the danger of soiling the peritoneum if the abscess were opened *in situ* was great, I placed several folds of gauze around the most prominent portion of the tumor and applied a bandage. There was a large escape of serum through the drainage thus secured, with prompt mitigation of inflammatory symptoms. July 24 the gauze packing was removed and the abscess opened. It was found to contain a small

amount of offensive pus, a gangrenous appendix, and an enterolith about as large as the end of my little finger. The cavity was thoroughly cleansed and disinfected, the appendix, removed in the usual way, and the adhesions entirely separated. A gauze drain was passed down so as to cover the stump of the appendix, to guard against infection if there should be any leakage, and the abdomen closed. Patient made an uneventful convalescence. August 14, he was about ready to leave the Hospital when I found that he had had no movement of the bowels for two or three days, notwithstanding he had been taking purgatives. He had, indeed, had some trouble in securing a movement for the preceding ten days, but had secured an evacuation on every alternate day until the time mentioned. I prescribed vigorous cathartics, which were taken through August 15, but without securing any movement. There was a great deal of pain through the abdomen, and intestinal peristalsis was very vigorous. It becoming evident that the intestinal obstruction was complete, I reopened the abdomen in the median line, August 16. The incision showed two loops of small intestine stretched across the right half of the abdomen and quite firmly adherent to the right side. These two loops were adjacent to each other. Above them the small intestines were markedly distended, below, entirely empty. These adhesions were quite firm and were broken up only with considerable difficulty. Only these two points of adhesions could be found, and these were above the site of the original incision. The patient made a prompt recovery from this second operation, although at one time he had an attack of acute indigestion which caused some anxiety lest it should be indicative of other obstruction.

Considering the extensive adhesions which frequently exist, especially in cases in which an appendiceal abscess is simply opened and drained, it seems somewhat surprising that we do not oftener have obstruction following that operation, yet in an unusually large experience with appendicitis this is the first case in which I have had that complication. In this case the adhesions which produced the obstruction reformed after the operation. At the operation all the adhesions were carefully separated.

Case 5.—July 21, 1897, Dr. Murray had several attacks of acute appendicitis, and gave a history of four years of trouble with this organ. The pain he described as that of a "hot tack" and located it exactly at the McBurney point. Operation revealed an ordinary catarrhal appendix, with some adhesions. The operation was made as usual and convalescence was uninterrupted.

His description of the "hot tack" sensation was to me original, and I include his case on that account.

Case 6.—July 21, 1897, Wm. H., presents the usual swelling of an appendicitis. Has been sick for ten days, but called no physician until today. Patient has a temperature of 100 and pulse 120. Has been in about this condition for the past ten days. An examination reveals the presence of a general peritonitis, probably purulent in character. Patient was operated upon the next morning. The operation revealed a gangrenous appendix, with a large amount of free pus in the abdominal cavity. There were no adhesions, although large amounts of lymph were present between the loops of intestine. The pus was very offensive in character. The appendix was removed, the abdominal cavity cleaned out thoroughly, and gauze drain inserted in different directions through the abdomen. Patient was in bad condition when put on the table, the eyes being sunken and surrounded by dark rings, and everything indicating impending collapse. This collapse came on soon after the completion of the operation and he died a few hours later.

Case 7.—August 3, 1897, B. O., aged 8 years, was seen in consultation with Dr. Cooperrider. The patient had been sick for three days with the ordinary symptoms of acute suppurative appendicitis with septic peritonitis. Her general condition was bad, but she was operated upon at once. Operation revealed a gangrenous appendix with general purulent peritonitis. Thorough cleansing and drainage were resorted to, but without benefit, as the patient died a few hours later. Dr. C. had not been called into the case until the third day.

Case 8.—August 3, 1897, M. H. C., male, aged 75 years, was seen in consultation with Dr. Jenkins. He was taken with appendicitis eight weeks ago. So far as could be learned, this was a first attack. There is now present a large swelling, evidently containing pus, but not particularly painful. It has, however, within a few days given him more pain and is enlarging. At this time the presenting mass was as large as a child's head. Operation was made by the usual incision, and a cavity found containing pus. This cavity being cleaned out, I found a deeper cavity, apparently not connected with the first one. This I opened and also washed out. No attempt was made to find the appendix, as the patient was not in a condition to bear any extended operation, which was performed at night. Both cavities were packed with gauze. The general cavity of the peritoneum had not been opened. This patient made an uninterrupted recovery.

The case is of interest chiefly from the extreme age of the patient.

Case 9.—August 14, W. J. M., aged 34, fireman, was seen in consultation with Dr. G. M. Waters. Has always enjoyed good health until yesterday morning, when he was taken with some pain through the abdomen. This was supposed to be due to a little indigestion, but about midnight the pain became so severe that he went to the doctor's office, who gave him a hypodermic injection of morphin and remained with him for a couple of hours, when he became well enough to be taken home. He has been suffering all day. His temperature now (5 P.M.) is 102, pulse 120; has an anxious expression of countenance, suggestive of impending purulent peritonitis. The abdomen is tender throughout and somewhat distended. He is nauseated. He was operated upon at 8 P.M. The intestines were found covered with a light flocculent exudate, containing some pus and having a very offensive odor. The appendix was found without difficulty, having a perforation about a half inch from its tip. This perforation probably occurred at midnight, when the pain suddenly became so intense. Old adhesions partially bound the appendix down so that its removal was not easy. It was removed, however, in the usual way, the intestines carefully cleansed, the field of operation lightly packed with gauze and the incision closed, except at the point of drainage. Convalescence was absolutely uneventful.

This case, together with Cases 6 and 7, serve to confirm the fact established by the general experience of abdominal surgeons, that a general purulent peritonitis that has existed for three days or more, uniformly results fatally. In a recent monograph on this subject, Professor Abbe of New York places the maximum limit at two and a half days. I have operated on at least fifteen cases of general purulent peritonitis following appendicitis, and in none of them in which the operation was deferred until or beyond the third day have I succeeded in saving the patient. In the last case reported, and I have had numerous similar ones, a delay of twenty-four hours would have probably caused such a distribution of the infection as would have rendered operation futile. In Case 7, while it was evident that we were dealing with an extensive peritonitis, our hope was that owing to the fact that only three days had elapsed, the disease would be so localized that an operation would result successfully.

One peculiarity of Case 6 is that the patient should have lived so long, ten days, without giving evidence of being so sick as to lead his parents to send for a physician, and yet at the time of the operation the pus was distributed everywhere throughout the abdomen. The symptoms, however, had not been particularly alarming. Some years ago I saw a case in which, at the end of a week, but with an abdomen distended with pus, the temperature was below 100, and the pulse soft and 80 per minute. The patient was on the verge of collapse, and died a few hours after an operation for the removal of the pus and appendix. In another case, with a similarly extensive amount of disease, the patient had been up and around the house more or less every day and was not regarded as dangerously sick. She collapsed, however, suddenly, after a visit from her physician, and died within an an hour. The postmortem examination at which I was present, revealed the existence of a most extensive purulent peritonitis, due to perforated appendix.

Case 10.—Oct. 11, 1897, Mrs. L., aged 26, was seen in con-

sultation with Dr. Leach. Had been entirely well, as was supposed, until yesterday afternoon when she was out riding with her husband. While riding she was suddenly seized with an intense pain in the lower abdomen and pelvis. Became very much prostrated and fainted away. Was taken by her husband into a house by the wayside, and after remaining a couple of hours was able to be taken home. Had several attacks of fainting during the night. Has had constant pain through the abdomen, but several paroxysms of very severe pain. Has been given cathartics, but without effect. Has vomited several times. Enemas have also been given, but with no effect. Has a babe 9 months old. She menstruated once, a few weeks after the birth of this child, Then not until June 20. Since then she thinks she has been regular. Menstruated about a week ago, but since the cessation of the flow has noticed every day a little discharge of bloody mucus. Her temperature has been found at times normal, and at other times a little above 100. It is now 100.3. Vaginal examination shows the womb pushed forward behind the pubes. The sensation transmitted to the finger is that of fluid in Douglas's cul-de-sac. Cervix and os patulous. It is not known how long this condition has existed. Abdomen is somewhat tympanitic and excessively tender, uniformly so over the lower part. No special tenderness in the right iliac fossa. On auscultation can elicit no evidence whatever of peristalsis. On turning the patient on her side there seems to be dulness in the depending portion of the abdomen. This diminishes when the patient is turned on her back. Her appearance is that of decided collapse.

With the above history and the condition of the pelvic organs, a presumptive diagnosis of hematocele from a ruptured ectopic pregnancy was made, although from a lack of history of irregular menstruation a possibility was held of shock from a ruptured abscess or similar condition.

Operation was made as soon as possible. On making the usual incision free pus escaped as soon as the abdomen was opened. This pus welled up freely. The pelvis was found full of pus. Nothing wrong was found with tubes or ovaries. On passing the fingers to the region of the appendix, that organ was found two and a half inches long, club-shaped and very much thickened and inflamed. Could find no perforation. The intestines in this region were more decidedly inflamed than elsewhere, and some lymph was present, but no adhesions whatever. After removing the appendix in the usual way, the intestines were withdrawn from the abdomen, being carefully protected by hot towels, and the entire abdomen most thoroughly flooded with hot water, the hand and arm being introduced so that all the viscera were thoroughly cleansed. The intestines and omentum were then replaced and gauze drains carefully inserted. The patient stood the operation well and when put to bed had a better pulse than at the beginning of the operation. The infection, however, had been so extensive that she never rallied, but died the next day.

The suddenness with which the symptoms appeared and the rapid collapse without perforation, render this case unique in my experience. The operation was made less than twenty-four hours from the beginning of her symptoms.

During the last twenty years I have seen a very large number of cases of appendicitis. A considerable portion of these have been subjected to operation. While I am satisfied that at least 80 per cent. will recover without operation, I am firmly convinced that if all cases were operated upon as soon as the diagnosis was made, the operation being made by competent operators and with suitable surroundings, the mortality from the disease would be very much diminished.

RUPTURE OF THE URINARY BLADDER, WITH REPORT OF A CASE OF EXTRA-PERITONEAL RUPTURE COMPLICATED WITH FRACTURE OF THE PELVIS.

Read before the Minnesota Academy of Medicine, March 1898.

BY ARCHIBALD MACLAREN, M.D.

ST. PAUL, MINN.

Rupture of the urinary bladder always had been and is still a very serious accident. Walter Rivington, Surgeon to the London Hospital, after a careful study of the literature up to 1885, finds the records of 322 cases, with 40 recoveries. In this list there are eight recorded recoveries after intra-peritoneal rupture, six of which Dr. Rivington rejects as unauthentic. James F. Mitchell of Baltimore, in the *Annals of Surgery*, February 1898, reports ninety cases of extra-peritoneal rupture of the bladder, complicated with fracture of the pelvis, with a mortality of 83 per cent.

There are several apparent reasons for the very great mortality following this accident; 1, because any injury, which is severe enough to produce extra-peritoneal rupture of the bladder, usually fractures the pelvis. This traumatism is often associated with extensive hemorrhage, and also with shock, which, of itself, has at times been enough to cause death in the first few hours after the accident; 2, in intra-peritoneal rupture of the bladder the abdominal cavity is immediately flooded with urine, which, if septic, at once produces an acute peritonitis, but even if the urine is sterile the patient soon becomes poisoned by urinary absorption, as is shown by Coats in the *British Medical Journal* of 1894. He speaks of the difficulty of making a diagnosis of intra-peritoneal rupture on account of the frequent absence of peritonitis. He quotes several cases, reporting one of his own, in which there was no peritonitis, nor any inflammatory changes in the bladder wound, even when studied microscopically several days after the intra-peritoneal rupture. It is not clear to my mind, why the same result is not produced experimentally, but such seems to be the fact, as shown by Weggner. He injected healthy urine, in large and repeated quantities, into the peritoneal cavity of rabbits, and reports that the urine was quickly absorbed without producing any ill effects. It is probably a matter of quantity, combined with the shock and traumatism, accompanying the accident of rupture, which makes intra-peritoneal extravasation so much more dangerous than experimental transfusion.

Ruptures of the urinary bladder are of three varieties, traumatic, pathologic and idiopathic. The majority of those in the first variety, occur in patients who have been crushed under a weight, between cars or run over by some heavy vehicle, injuring the lower abdomen while the bladder was distended with urine, these cases occurring from direct violence. Henry Morris speaks of cases of indirect rupture, where the patient was thrown upon the buttocks without fracturing the pelvis.

To the second or pathologic class, belong these cases where the rupture of the bladder wall is due to ulceration and sloughing from inflammation or from pressure. Rivington reports ten cases due to the pressure of a retro-displaced, pregnant uterus, which he had seen or found reported.

In the third or idiopathic variety, a few cases only are reported by Rivington, and in these no disease was found, only over-distention. The symptoms are: 1, the history of the accident, occuring in a patient who is usually intoxicated; the intoxication itself tending to produce an over distention of the bladder. Then there is loss of ability to pass water, perhaps passing only a few drops of blood, or at most, an ounce of bloody urine; 2, pain and abdominal distention with shock, in intra-peritoneal rupture, or extravasation of urine in extra-peritoneal rupture, with or without the symptoms of fracture of the pelvis.

The diagnosis is frequently very difficult in the early stages, but it is in these very cases that there is the greatest chance for successful treatment. The diagnosis is made from the history, combined with the passage of a catheter. The catheter usually draws a little bloody urine. If a long metal catheter be used, it may be passed through the rent in the posterior wall of the bladder, as this is the location of the tear in about 60 per cent. of cases, when it may be felt through the abdominal wall or through the rectum. When the catheter passes into the peritoneal cavity a few ounces more of bloody urine may be drawn. Abdomino-rectal, bi-manual palpation will always aid very materially in diagnosis, especially in the extra-peritoneal ruptures which sometimes occur at the base.

W. J. Walsham of London, in the *Medical Journal* of 1895, suggests the injection of air into the ruptured bladder. In the few cases in which this method has been tried it has produced such a profound collapse, that, although useful, it has been abandoned. Bridden and George Heaton propose a much safer method for diagnosis which is the injection of a known quantity of boric acid solution just before the operation. If the distended bladder can not be felt above the symphysis and the same quantity of fluid, that was injected does not return through the catheter, the diagnosis is certain. The only danger of this precedure, in early cases, is that an incomplete rupture might be made complete, and in late cases, adhesions between the intestines and the bladder might be broken open.

With regard to treatment of this condition, we find that suture was first suggested by Benjamin Bell, in 1779. This was first attempted by Mr. Millett of Bartholomew Hospital, in 1876. This attempt was not successful. Sir Henry Thompson, as late as 1883, says "success can hardly be expected in suture of intra-peritoneal rupture."

The first successful case was operated upon in 1886, by Sir William MacCormac, and George Heaton believes that before this time all cases of intra-peritoneal rupture, treated by simple catheterization, with sometimes an attempt to wash out the peritoneal cavity, or treated by median or lateral cystotomy with drainage, had all proven fatal. Bridden reported to the New York Medical Association in 1895 three fatal cases, in which he had opened the peritoneal cavity and sutured the rent. The first case was operated upon the fifth day, the second eight hours, and the third thirteen hours after the injury. George Heaton of Birmingham, in the "Annals of Surgery," of 1896, reports fifteen cases of intra-peritoneal rupture successfully treated by suture up to that time, including one of his own. Deaver, in the "Annals of Surgery," of 1896, reports one case of extra-peritoneal rupture of the bladder, with suprapubic drainage, where the patient passed urine by the urethra on the fifteenth day. J. W. White, in "Dennis' Surgery," in discussing extra-peritoneal rupture, says that he "believes that suture of the bladder wound in these cases is of doubtful value." He advises a suprapubic opening for the extravasation, with perineal drainage. When there is extravasation there should be several free incisions three or four inches long. White reports a case in which he believes that an extra-peritoneal rupture healed spontaneously with the formation of an abscess which was opened in the groin some weeks later. Mitchell favors the line of treatment laid down by White, combined with the constant use of hot water in the form of a bath. He reports two recoveries, including the one operated upon by Bloodgood, in which the patients were constantly in the hot bath for several days.

My own case was operated upon in June, 1894. The patient, Mr. C. W. R., was referred to me by Dr. A. B. Ancker of St. Paul, on the morning of June 28. The patient had been brought to the city hospital at midnight, having been crushed at 11 P. M., June 27, by the falling of a brick wall. He was recovering from the shock which immediately followed the injury. His head and face were bruised and there was a superficial cut in the perineum. The pelvis was fractured through the left pubic bone, the jagged edges of the break being distinctly felt through the skin, one and one-half inches to the left of the median line. After passing the catheter, three ounces of bloody urine were drawn. There was an extensive extravasation of urine over the left Poupart ligament, the penis and scrotum were both swollen and edematous. The patient was immediately etherized, and an incision four inches long was made over the most prominent point of extravasation; considerable bloody urine was found in the wound. The fracture of the pelvis was continuous with the cavity formed by the extravasation of urine. A perineal section was made and a drainage tube left in the wound.

The boy's temperature was 103 and pulse 150 very soon after the operation. A broad hip band was applied to lessen the movement of the fractured pelvis; both the suprapubic and perineal wounds were kept open for drainage three weeks, after which time they both closed and the bay passed urine through the urethra. August 1 a suppuration at the site of the suprapubic wound necessitated its being reopened and drained. The drainage, however, was imperfect, and the boy commenced to have an evening temperature of 101, which continued until September 15, when what appeared to be a large retro-peritoneal abscess, extending as high as the lower border of the left kidney, was opened in the lumbar region and thoroughly drained. It was not possible at that time to demonstrate any connection between this abscess and the bladder wound, but such a connection, no doubt, existed. The evening temperature immediately dropped to 99, and the patient soon entirely recovered. October 15 he came to my office, wearing a broad hip belt. He had gained twenty pounds in weight and was able to walk a little without crutches. The next year he was able to play base-ball very creditably, and also became a long-distance rider. I have seen him during the last year, and his recovery is apparently perfect in every way.

A REPORT OF TWO CASES OF GANGRENOUS PANCREATITIS WITH DISSEMINATED FAT NECROSIS.

Read before the Chicago Pathological Society, Feb. 14, 1898.

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While on the house staff of the Cook County Hospital two cases of gangrenous pancreatitis came under my observation. Although the knowledge of pancreatitis has greatly increased during the past few years instances of this interesting disease are still so infrequent that the following cases are deserving of report:

Case 1.—Susie L., age 47, white, married, Irish; was admitted to the service of Dr. J. B. Murphy June 7, 1897. Her father and one sister died of tuberculosis, the mother is still living and well. The patient is the mother of three children and has had two miscarriages. The last labor occurred twelve years ago and in all labors the puerperium was normal. The menses were always normal. She denied all syphilitic history. Her daughter informed us later that for the past nine years she had been drinking brandy to excess. The patient informed us that she had had "Bright's disease" for the past few years and had been in the "Sisters' Hospital" for the same. Otherwise her health had always been good. Her present illness began five days before entrance to the hospital. While going to market she was seized with severe cramps in the abdomen and "fell to the ground." She had to be carried home and was given morphin hypodermically repeatedly for the pain, which was severe enough to prevent sleep. At the onset she also had a chill and vomited several times. The bowels were constipated for the first five days. The sharp, piercing pains had recurred several times; they did not radiate in any particular direction and were located in the epigastric region.

Status præsens.—The patient is well nourished, the face flushed, the conjunctivæ subicteric; the pupils are equal and respond to light and accommodation. The nose and ears are negative; the pulse is rapid and weak (124); the chest is symmetric; the respirations are shallow and somewhat rapid (30); the lungs and heart are negative; the abdomen is distended, tympanic and very tender; in the right hypochondriac region there is an area of increased resistance. The tenderness, though general, is most marked in the epigastric region; no evidences of syphilis were found; an examination of the urine showed the following: acid, straw color, specific gravity 1012, slight amount of albumin, a few hyalin casts but no sugar. During the course of her illness several examinations for sugar were made but none was found.

The patient would not consent to an operation until three days after her admission to the hospital. After the usual preparations for laparotomy had been made the patient was anesthetized with ether. A vertical incision about three inches long was made in the right hypochondriac region directly over the indurated area. The parietal peritoneum was sutured to the skin. The intestinal coils wore found matted together by a fibrinous exudate. The omentum in this region was hyperemic, thickened and studded with small grayish areas; they were situated in the substance of the omentum and not raised above its surface; they varied in size from that of a pin head to that of a pea. The peritoneal cavity contained considerable clear, straw-yellow fluid. After walling off the peritoneal cavity with iodoform gauze a large gauze and rubber tube drain was inserted. A small piece of omentum was ligated off and excised for microscopic examination, which showed that the grayish areas were typic foci of fat necrosis, such as are seen almost without exception in cases of pancreatitis. The wound was dressed daily. After the operation the patient suffered less pain for a time. The dressings were always found saturated with a clear fluid. The borders of the necrotic tissue became rough and raised, and showed other signs of sloughing. The discharge soon contained shreds of fibrin and small masses of dirty-gray necrotic tissue. The pulse remained at 120 to 130, the temperature varied between 100 and 102 and the respirations between 32 and 36. On the ninth day after admission she had an attack of sharp, cutting pains running from the lower end of the sternum to the back, which attack lasted about half an hour. At this time the facial expression was anxious, the tongue had a heavy white coat, the conjunctivæ were still subicteric, the heart and lungs negative. The pain in the abdomen had stopped, though the dirty-gray discharge continued. The bowel movements were liquid, greenish yellow and contained strings of mucus. Three weeks after the operation the patient was in about the same condition. The temperatures varied greatly between normal and 103. The pulse was weaker and more rapid (130 to 145); the respirations were rapid (40 to 48), but not costal in type such as are seen in acute peritonitis. After irrigating the wound for some time it would be noticed that considerable necrotic tissue still came from the upper angle. On exploration a large cavity was found below the right lobe of the liver which extended as far as the finger could reach toward the region of the head of the pancreas. Masses of loose necrotic tissue, which varied in size from a hazel to a hickory nut, could be taken from it with the forceps. The bowel movements and urination had become involuntary and the patient was very restless. She had lost about ten to fifteen pounds in weight. Death occurred twenty five days after the operation, with symptoms of a slow form of sepsis.

Autopsy, abstract.—Studding the omentum and to a lesser extent the parietal peritoneum, were numerous areas varying in size from those just visible to larger areas, 0.5 centimeter in diameter. Most of the areas, especially the larger ones, were surrounded by a narrow hyperemic zone. They were circular, white, well defined and not raised above the level of the surrounding tissue. Those in the parietal peritoneum were most numerous above the level of the umbilicus, but scattered foci were present here and there as low down as the brim of the true pelvis, on the serous coating of the psoas magnus and above the inguinal orifice. The intestinal coils were adherent to each other and to the omentum, but easily separated. A considerable quantity of bloody fluid was present in each side of the abdominal cavity.

The pericardial cavity contained a sanguinolent exudate; both pleural cavities contained a moderate amount of clear yellow fluid; the lungs contained a few small calcareous nodules in the apices; the heart weighed 275 grams and was flabby; endocardium, myocardium, valves and orifices showed no gross changes; there were no changes in the coronaries or intima of the ascending aorta; the spleen weighed 230 grams, large, soft and adherent to the under surface of the diaphragm; on section it showed a large white infarct the size of an English walnut; the kidneys were alike in appearance, external surfaces smooth, capsules readily removable, cortical markings fairly distinct and relations of pyramid to cortex normal; together they weighed 325 grams; the uterus was small and presented the changes commonly seen in chronic endometritis; the right Fallopian tube was dilated and contained a small quantity of purulent fluid; the liver weighed 1500 grams, was soft and light red in color; on section the lobular markings were distinct; the gall bladder contained a thin pale bile, scanty as to quantity; the common duct was patent.

The pancreas was represented by a mass of gray, granular necrotic tissue, which was easily torn in removal. The necrosis had more of a liquefactive character in the region about the head and right half of the organ. The left half was studded with numerous larger and smaller grayish districts, which at various points fused together to form still larger conglomerate grayish or grayish-yellow masses. The material composing these areas was distinctly cheesy and soft and appeared at times to be formed in part at least of retained and inspissated pancreatic secretion. In and around the pancreas considerable chocolate-colored fluid, containing masses of necrotic tissue, were found. The stomach was adherent to the spleen. Behind it was found a cavity, well walled off, which contained a hemorrhagic, semi fluid material with masses of necrotic tissue in it. The intestines showed no important changes except those incident to the peritonitis. Examination of the cranial contents was not allowed.

Anatomic Diagnosis.—Gangrenous pancreatitis, with disseminated fat necrosis; localized suppurative peritonitis, with laparotomy fistula; diffuse fibrinous peritonitis; infarction of the spleen; hydrothorax; chronic apical tuberculosis; cloudy swelling of myocardium and kidneys. Microscopic examination of the areas of necrosis in the omentum and pancreas showed the usual changes found in such areas, viz., a central district of granular non staining tissue débris, surrounded by a more or less marked zone of densely accumulated leucocytes. There were no signs of tissue proliferation about any of the areas examined.

Case 2.—William F., age 43, white, widower, Irish; was admitted to the service of Dr. J. B. Herrick, Sept. 28, 1897. The family history is negative. The patient was a railroad man and drank daily fifteen to twenty glasses of whisky as well as considerable beer. His health has always been good with the exception of an occasional "bilious attack." He denied all venereal history. His present illness began one month ago after eating a few small apples and drinking several glasses of cold beer. A few hours later, while still in the saloon, he was seized with severe pains in the abdomen. He was given several doses of morphin hypodermically as well as hot drinks containing whisky. Following this he had no bowel movements for five days and vomited everything, even water, when taken by mouth. The vomitus was never fecal. The urine, he said, was scanty and of high color. At times he referred the pain to the epigastrium, but usually to the right and left iliac regions.

Status præsens.—The patient is a large muscular man, weighing about 250 pounds; the skin is moist and warm; the tongue is covered with a heavy, dirty, white coat; his mental condition is good; the chest is symmetric in form, the respirations rapid and shallow (28 to 36); no adventitious signs are revealed on examination of lungs; the respiratory excursion is somewhat thoracic in type; the area of cardiac dulness is slightly increased in all directions, no adventitious sounds heard; the pulse is rapid and feeble; the abdomen is much distended and the walls thick; there was dulness in the flanks and an area of dulness in the right iliac region.

Though he did not usually complain of pain, his abdomen was diffusely tender, most marked in the iliac fossæ; numerous pigmented scars were found over the tibial region. While under observation in the medical ward his pulse varied between 116 and 120 and was very weak; the temperature was usually normal, but at times would rise to 100 and 101 degrees F.; respirations varied between 28 and 36. On several occasions he had attacks of severe prostration, characterized by the extremities becoming cold and cyanotic and his radial pulse growing almost imperceptible; at other times he would be restless and sleep but little. The vomiting was persistent; the only thing retained was whisky given in half ounce quantities. Purgatives and repeated colonic flushings failed to bring away any fecal matter. Six days after admission to the medical ward, though in a precarious condition, an operation was considered advisable and the patient was transferred to the surgical service of Dr. T. A. Davis.

An exploratory operation was decided upon and a vertical incision about three and a half inches in length was made in the right iliac region, where an area of dulness was outlined. As soon as the peritoneal cavity was opened a gray turbid fluid containing shreds of necrotic tissue and fibrin escaped. The omentum was much reddened and studded with white areas, pin head to pea size, which were not raised above the surface. The intestines and omentum were matted together by fibrinous adhesions, and walled-off numerous pockets containing the same turbid gray fluid above described were found. A large gauze drain was inserted and antiseptic dressings applied. The patient died soon after the operation. The diagnosis of pancreatitis was confirmed by the postmortem findings.

Autopsy.—The postmortem examination showed the following: A man, well nourished, neck thick, chest full, abdomen distended, rigor mortis well marked. In the right flank is a recent incision about four inches long, from which bloody fluid exudes. Slight adhesions exist between the abdominal wall and the omentum. The peritoneum is rough with fibrinous masses adherent to it. In the omental fat, and to a lesser extent the abdominal wall, are irregular grayish white patches varying from minute to larger coalesced areas. Those in the abdominal wall are found only near the peritoneum. The abdominal cavity contains a turbid grayish red fluid. The pleural cavities are empty. The pericardial cavity is empty and its surface smooth. The tongue, pharynx, trachea and esophagus show no changes. The thyroid is small. The lungs crepitate throughout and their lower lobes contain much frothy blood. The peribronchial glands are enlarged and markedly calcareous. The heart weighs 400 grams and on its anterior surface is an irregular white patch, at the lower border of which there is calcareous material. It contains fluid blood and a few large clots in the right side. The tricuspid orifice admits six fingers. The right auricle is large. The endocardium is normal with the exception of a few areas of thickening in the mitral valves. The mitral admits five finger tips. There are several aberrant chordæ tendineæ in the left ventricle. The heart muscle is smooth and flabby, reddish yellow in color, and has a boiled appearance. The coronary arteries are tortuous and show a few yellow areas of thickening.

The spleen weighs 220 grams. Its surface is covered with a fibrinous exudate. It is soft, the pulp is swollen and there is little connective tissue. The kidneys together weigh 380 grams. The capsule is not adherent. The kidney substance is soft, the cortex swollen and the cortical markings indistinct. The urethra, bladder, ureters and testicles are negative. The liver weighs 2100 grams, and is adherent to the diaphragm which is pushed up to the third rib on the right side and the fourth on the left. The liver substance cuts readily, the surface being rather granular, of a uniform red color, with small areas of a deeper red. The gall bladder is distended with thick, viscid, dark green bile. The mucous membrane is smooth and velvety.

A large cavity is found in the region of the pancreas. It contains fluid of a dirty yellowish gray color, mixed with shreds of disintegrated material. The fluid has escaped into the abdominal cavity through a rupture whose margins are necrotic, and of a bluish gray color. Stretching across the cavity are remnants of the pancreas, much softened. The entire pancreas is involved in the cavity and contents. The fat tissue around the pancreas contains numerous white areas like those found in the omentum. The coils of small intestine are slightly adherent to each other by fibrinous masses. Large clots of fibrin are found in the posterior part of the abdomen.

Bacteriologic examination.—There was found in the blood from the heart, and in the spleen, liver, kidney, and in the necrotic areas in the subperitoneal fat, a bacillus corresponding to the cultural and other characteristics of the bacillus coli communis.

Anatomic diagnosis.—Gangrene of the pancreas; disseminated fat necrosis of omentum and subperitoneal fat; diffuse sero-fibrinous peritonitis; acute degeneration of the kidneys; cirrhosis of the liver; dilatation of the heart and degeneration of the myocardium; sclerosis of the coronary arteries; calcareous and caseous areas in the peribronchial lymph glands.

A histologic examination of the areas of fat necrosis showed practically the same conditions as those of Case 1.

The literature of pancreatitis has been so recently summarized by Simon Flexner[1] that only a few salient points will be mentioned here. According to Fitz,[2] fat necrosis in the peritoneal cavity is infrequent in the suppurative and relatively frequent in the hemorrhagic and gangrenous forms of pancreatitis.

The first attempt to prove the relation between the pancreas and areas of fat necrosis was made by Langerhans.[3] From his studies he concluded that fat necrosis was due to a decomposition of the fat molecule and a combination of the fatty acid with calcium salts present in the blood, to form a calcium soap. By injecting fresh pancreas pulp into the peritoneal fat tissue of a rabbit he produced a local inflammation with areas of fat necrosis.

Experiments by Dettmer, Hildebrand, Korte and Williams show, as previously asserted by Senn: 1, That the secretion of the pancreas can enter the peritoneal cavity without causing inflammation; 2, in a certain number of cases the free sterile pancreas or its secretion causes areas of necrosis; 3, the element of infection plays an insignificant part.

Dettmer found that pure trypsin caused a sero-hemorrhagic exudate into the peritoneal cavity, but did not set up fat necrosis. Hence it was concluded that in all probability the fat-splitting ferment was the active agent.

Flexner experimented on cats and dogs, ligating the veins coming from the pancreas, or one-half of the pancreas itself. By both methods he caused fat necrosis. The conclusions of Flexner are: 1, In the peritoneal fat necrosis the fat-splitting ferment is demonstrable at certain stages of the pathologic process; 2, it is most abundant in the early period and may entirely disappear later; 3, though it can not be said positively that steapsin is the direct cause of the necrosis of tissue, such an assumption is rendered most probable by its constant occurrence in the diseased areas, its absence from healthy fat, and the nature of the pathologic changes; 4, the escape of the pancreatic secretion into the peri- and para-pancreatic tissues is the origin of the necrosis, and this escape is facilitated chiefly by lesions of the pancreas and by disturbances in its circulation. Fat necrosis occurring from other causes is not excluded. It is quite probable, Flexner thinks, that some are due to microbic agents.

Accidental findings in the postmortems show that mild cases of fat necrosis occur which do not cause death. Balser,[4] who first described fat necrosis, found it present in five out of twenty-five postmortem examinations. The areas were present in the intra-acinous tissue of the pancreas or the adjacent fat tissue. Since that time they have been found in many instances in which a gross disease of the pancreas was wanting. In such cases the areas were usually small. In Balser's cases the cause of death varied greatly, as is seen from the following enumeration: 1, Male, 52 years old, much emaciated, phthisis pulmonalis; 2, male, 42 years old, general anasarca, aortic regurgitation and stenosis; 3, male, 61 years old, carcinoma of stomach, peritoneum and omentum; 4, male, 48

years old, much emaciated, carcinoma of stomach; 5, male, 60 years old, emaciated, cirrhosis of liver.

The etiology of pancreatitis is not definitely known. Syphilis and an excessive use of alcohol are mentioned by most writers as the chief factors. Eichorst, Koenig, Senn, Strümpell, Loomis, Osler, Ziemssen and Eulenburg speak of pancreatitis as sometimes following acute tuberculosis, typhoid, pyemia, septicemia and parotitis. The chief symptoms mentioned by all are: Sudden onset, with violent colicky pains in the epigastrium, vomiting, early collapse, constipation or diarrhea, with frequently fat in the stools and sugar in the urine.

In the cases reported by the writer there was a history of the excessive use of alcoholics in one and of alcoholism and syphilis in the other. Both cases had a sudden onset with severe colicky pains, by one referred to the epigastrium, by the other principally in the iliac fossæ. The first case had diarrhea and later involuntary bowel movements. The second had obstinate constipation. Both vomited excessively.

The surgery of pancreatitis is not definite. Senn[5] speaks of making a lumbar incision for drainage after making an abdominal incision. Koenig, however, thinks a diagnosis is seldom made before the rupture of the pancreas into the free abdominal cavity has taken place. Eichorst claims a positive diagnosis is impossible.

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A CASE OF CONGENITAL MALFORMATION OF THE HEART.

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Mrs. B., was confined May 5, 1898, at 3 A.M. Ineffectual pains had persisted at intervals since 2 A.M., May 2, with partial escape of amniotic fluid at that time. It was not, however, till the evening of the 4th that the uterine contractions became regular and vigorous. The case was a brow presentation. The head was considerably deformed by pressure and a couple of minutes elapsed before respiration was established. The child's cries were weak and hoarse. It was remarked that the action of the heart was unusually vigorous. After an hour the child was left in apparently good condition.

At 5 A.M. the writer was summoned with the report that after a feeble attempt at nursing the child had died in the mother's arms while she was sleeping.

An autopsy made a few hours later showed the lungs only partially distended. The heart was normal in appearance, filled with fluid blood. There was a partial defect in the inter-ventricular septum consisting of an opening 5 mm. in diameter at the top of the septum and so situated that a probe introduced into the aorta, entered much more readily into the right ventricle than into the left. In other respects the heart was normal.

The conclusion was arrived at that incomplete aeration of the blood was the cause of death and that the exaggerated heart action was an effort at compensation.

CHRONIC SUPPURATIVE ETHMOIDITIS.

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Both acute and chronic inflammation of the ethmoid cells occur in a much larger proportion of cases than is generally supposed, and from the intimate relation of these sinuses with the cranial cavity and accessory nasal chambers irreparable damage may result in a comparatively short time from the onset of the affection. Either the anterior or posterior ethmoid cells may be the seat of a suppurating process, alone or in conjunction with the maxillary antrum, frontal sinus or sphenoidal cells and the morbid changes may be acute or chronic, the affection commencing as a simple congestion of the mucous lining and disappearing in a short time, or pus may form, with serious results to the bony tissue and adjacent parts. The posterior group of cells with which we are concerned in this paper are not affected as frequently as those situated anteriorly, and therefore have not been studied to the same extent as have diseases of the latter region.

Acute or chronic rhinitis is probably the chief etiologic factor in a considerable number of cases, the inflammation spreading from the nasal mucous membrane to the lining of the cells and from the intimate attachment of the mucous membrane to the bone, changes in the latter structure taking place quite early, while suppuration of the adjoining sinuses may communicate to the ethmoid region, this being seen especially in suppurating frontal sinusitis and occasionally from the sphenoid cells and antrum of Highmore. Retention of secretions from closure of the ethmoid opening into the nasal cavity, may result from simple hyperplasia of the middle turbinal or from a polyp obstructing the outlet, but in not a few cases these are effects of the ethmoid inflammation and not causes. Other factors, such as irritation resulting from the retention of a foreign body in the nasal chamber, may be prominent in the etiology and general affections, or dyscrasias may produce local changes in this region, among these syphilis especially in the tertiary form, being the most common, while tuberculosis has been credited as the cause in a small number of cases.

When the ethmoid cells adjacent to the frontal sinus are affected, the patient may complain of a dull pain at the root of the nose and a unilateral purulent discharge from the nasal cavity, and when suppuration is confined to the posterior cells these symptoms may also be present, but the case often requires careful study before the nature of the affection is fully comprehended. Usually the patient will complain only of the symptom-complex forming the clinical picture of the ordinary form of chronic hypertrophic naso-pharyngitis and the nature of the affection becomes apparent only after careful investigation of the nasal chambers, but in the acute cases definite symptoms are present, that readily allow of prompt recognition. In the chronic affection with which we are concerned there may be no subjective symptoms of sufficient importance to specially attract the attention of the patient, and the recognition of the suppurative ethmoiditis must be based on the objective signs alone.

The affection may be either unilateral or bilateral, the former being most frequent except in specific cases where the entire bony structures of the nose are

destroyed. Examination of the affected nasal cavity will reveal the presence of pus, bright yellow in color before the bone becomes necrosed and later becoming thick and caseous as the solid structures are involved. The turbinal bones are seen to be hypertrophied, the middle especially being much enlarged and occasionally it is cleft near the median line. Mucous polypi are frequently present and the septum may be ulcerated from pressure by the hypertrophied middle turbinate. Much information can be gained by cleansing the nasal chamber and observing the location from which the pus comes. If the cavity be well illuminated and the head of the patient placed forward and toward the unaffected side, we may see a thin stream of purulent matter escaping over the middle turbinate. Posterior rhinoscopy reveals the middle turbinal to be much enlarged and frequently covered with accumulated pus which the patient has found impossible to dislodge.

Anosmia is a variable symptom and may or may not be present, it being difficult to obtain an accurate statement as to the presence or absence of the olfactory function, for should the duration of the affection be over a considerable period of time, the disgusting odor from the necrosed bone will prevent the patient appreciating other odors. General symptoms are observed in a few cases, the temperature showing a slight elevation at various times and there may be occasional rigors, but little information as to the nature of the affection can be gained from the general symptoms; more frequently, however, we find the patient complaining of loss of appetite and morning nausea, the result of swallowing the purulent secretions which escape into the pharynx during sleep. The general health may be seriously affected in other cases from septic absorption, the symptoms of septicemia being marked, as seen in other conditions, while in rare instances no indications of suppuration are present at any time during the course of the affection, the ethmoid involvement only being discovered accidentally as the following case well illustrates, no acute symptoms or rapid onset of the disease being noticed by the patient.

F. A., age 23 years, hat-presser by occupation, was first seen May 25, 1897, complaining of bilateral nasal obstruction; accompanying this was the discharge at frequent intervals and from both nasal chambers of fetid, membranous masses, and at all times the odor emanating from the nasal cavities was noticeable to those around him although he could not perceive it. At irregular intervals there was slight epistaxis and a muco-purulent naso-pharyngeal discharge, especially marked in the morning upon arising. The nose besides being obstructed, felt dry. This condition had existed for three years in a minor degree, but the fetor and obstruction had increased to a considerable extent during the past few months. Previous history was negative, no evidence of syphilis and no similar nasal trouble having existed in any of the family and he always having been exceptionally robust and healthy.

The left middle turbinal was much hypertrophied and almost touched the septum, especially at its posterior two-thirds; it bled freely on being touched with a probe and, in part, the epithelium was macerated, while other portions were denuded of their mucous membrane. Filling up the entire posterior half of the left nasal chamber was a black mass, resembling false membrane; removal of portions of this revealed the presence of a bed of pus beneath, the odor, on the least disturbance of the membrane, being almost unbearable. When all the secretions and membrane had been removed, the middle turbinal bone was seen to be denuded of its mucous covering at various points. The presence of dead bone was ascertained with the probe, and from the various necrosed areas in the turbinal, pus, green and fetid in color, was seen to exude. The inferior turbinal was moderately hypertrophied and inflamed, with loss in part of the surface epithelium, and on the septum directly opposite the middle turbinal was an ulcer due to necrosis of the mucous membrane covering the vomer. The right nasal chamber presented practically the same appearance as seen on the left, except that the middle turbinal was fissured, the probe on entering the cleft grating against dead bone. The turbinal on this side was more enlarged than on the left and was attached to the septum by a bony synechia. This was complete above the lower border of the middle turbinal, with a space below through which the air passed, and corresponded to the inferior nasal fossa. The pathologic process was more marked on the right, the patient complaining the most of obstruction and the presence of the membrane on this side, and on the left the membrane is discharged in small pieces after violent efforts, while on the right it frequently comes away in a single cast of this portion of the naris. Granulations were present over the necrosed areas in both middle turbinals.

The pharynx was sclerotic. Post-rhinoscopic examination showed a patulous inferior nasal fossa on both sides. The middle turbinals were much diseased, but the appearance presented nothing more than could be learned from an anterior view. The case was seen for treatment every third day for two months when he considered himself well enough to discontinue treatment and I have not seen him since. General symptoms were not well marked, occasional headache only of the frontal and occipital regions being noticed, and while there was a loss of a few pounds in weight, he presented no marked constitutional evidences of the severe local affection. The treatment consisted in removing the pus and debris with an alkaline, antiseptic spray and then what remained was removed with a probe and dull curette,; this was followed by thorough spraying with a peroxid of hydrogen solution, which not only cleansed the parts but controlled the bleeding and nosophen in full strength was insufflated over all the diseased area. Previous to this the patient was informed that he could only obtain permanent relief through operative interference under a general anesthetic; this was refused, so the parts were anesthetised with a 4 per cent. solution of cocain and necrosed bone and debris removed as far as possible with a sharp nasal curette, the parts then being covered with nosophen as previously mentioned; this was repeated at intervals until the membrane practically ceased to form and the nasal condition was decidedly improved. At the end of two months' treatment there was absolutely no odor, the septal mucous membrane was normal, the middle turbinals on both sides were greatly reduced in size allowing free breathing space, the pus and membrane had entirely disappeared and there was no post-nasal discharge. Treatment consisted essentially in removing all diseased tissue, obtaining free drainage and maintaining asepsis as far as possible.

Frequently perfect casts of the posterior half of

the nasal cavity were removed by forcibly blowing the nose; one of these casts on macroscopic examination measured one and three-quarters inches in length, by three-quarters of an inch from above downward; it was one-eighth of an inch in thickness, a deep grayish-black in color, with here and there over the external surface patches of pus and blood. Through the center of the cast was a perforation extending from before backward, approximately measuring one-quarter of an inch in diameter and through this central cavity respiration to a limited extent was carried on. The cast was thick and resembled moist papier maché to the touch and had a most intense odor; when dried it became shriveled and brittle and tough like leather. Portions of the membrane were placed under the microscope and pus, red blood cells, amorphous debris, cholesterin crystals, small particles of necrosed bone, bacilli and cocci were found forming the mass. The larger portion of the cast was composed of amorphous material and pus cells, the red blood cells being but few in number, while cholesterin crystals were found in considerable amounts. No researches were made as to differentiating the micro-organisms, except that the staphylococcus and streptococcus were found to predominate.

The dangers incident to suppuration of the posterior ethmoid cells increase as treatment is delayed or not thoroughly carried out. Caries and necrosis of the walls with extension of the inflammation to the fronto-ethmoidal cells and involvement of the orbit has occurred, while the cranial cavity may become involved and fatal meningitis result. The progress of this form of ethmoid disease is slow, often extending over months, and in this case several years elapsed before it was recognised. Although the course may be much shortened by prompt and radical treatment, yet a certain degree of caution must be observed in operating on account of the unfavorable location of the posterior ethmoid region.

3554 North Broad Street.

HAY FEVER.

BY W. H. WEAVER, M.D.

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CHICAGO, ILL.

My chief purpose in reviewing the subject of hay fever is to define more clearly, if possible, the philosophy of its treatment by internal medication in addition to the recognized surgical measures which should be adopted. The majority of patients have received only local nasal treatments, which have given variable success, no effort being made at internal medication. My experience in the past three seasons has convinced me that one of the most important factors in the pathology of the disease is the uric acid diathesis, or rather a condition of temporary uricacidemia. Uric acid, with other toxic matters which are retained with it in the blood, is certainly a violent irritant to the tender and irritable tissues in hay fever as well as in other diseased states; and when its importance is fully recognized it will be much easier to relieve the sufferer.

The nervous symptoms are reflex, from the local irritation of the sensitive area, reflex through the ganglionic and cerebro-spinal nerve connections. The ganglionic system presides over the functions of secretion and excretion, nutrition and circulation, as well as involuntary motion. These ganglia, composing the sympathetic system, also give warning through their intricate network of connecting nerve fibers, of abnormal conditions. The warning may be sent to the same organ in which the irregularity occurs, or to other organs. This will explain the production of various symptoms occurring in hay fever. The local irritation of Meckel's ganglion is reflected through its various branches, producing, in time, the symptoms of rose cold or hay fever—through the descending palatine branches, causing itching of the mouth, most often referred to the point where the nerve emerges from the posterior palatine foramen, as well as through the naso-palatine nerve at the anterior palatine foramen, behind the incisor teeth, through the internal nasal branches, causing engorgement of the erectile tissue with the profuse discharge of mucus through the upper posterior branches, the pharyngeal and a few through the Vidian nerve to the mouth of the Eustachian tube and pharynx, producing the itching of the ears and throat, through the branches to the ophthalmic ganglion, producing the intense eye symptoms observed in many cases, and through the branches of the cervical sympathetic ganglion producing hay asthma and dyspnea. In the milder cases the symptoms of dyspnea and asthma are often absent.

In the study of the etiology of this disease we find these two factors to be taken into consideration: first, irritation; and second, a sensitive area of membrane.

The sources from which come this intense irritation, producing the sensibility of the nasal mucous membrane, may be classed as external and internal. External irritants are dust, pollen of certain plants, most of which bloom during the latter part of August, septic germs and corrosive and irritating discharges and polypi. As internal irritants we have, as first in importance, toxic conditions of the blood, especially an excess of uric acid and the products of incomplete metabolism, or retained waste matters floating in the blood. This excess may be due to a too rapid supply of uric acid from a rich diet or faulty digestion, or to torpidity of the excretory organs, probably to both.

The heat of the summer with its relaxing effects and perspiration and consequent chilling of the surface, interfering with the proper action of both the skin and kidneys, the excessive amount of water drank and consequent delay of digestion, producing gastro-intestinal catarrh, all have a decided effect in loading the blood with impurities and lowering the resistance to the action of irritants As a second source of internal irritation may be mentioned reflex action from the sexual apparatus, due to the correlated action of erectile tissues, as so ably presented by Dr. J. N. Mackenzie. The varying character of the disease in different cases is due to the fact that these different factors vary in their pathogenic importance; now the local nasal condition is the cause alone, now the rheumatic diathesis, now the reflex influences from tumors or other causes, and possibly a neurotic element in some cases, and finally a combination of some or all of these elements.

These internal irritants, or toxic elements of the blood, must be expelled if success is attained in the cure of every case. This may be done by an eliminative form of treatment including alkaline and stimulating diuretics; a 0.65 gram dose of salicylate of soda with each meal often gives complete relief. A vapor bath may be given two or three times weekly. Light woolen underclothing must be worn to protect the skin from too rapid evaporation and chilling of

the surface. Diet should be plain and not stimulating restricted to those articles which do not produce much uric acid, sugar and meats sparingly. In many of the milder cases this medical treatment is sufficient to give immediate relief, but in order to make the cure certain and permanent in all cases the second factor in the etiology, the sensitive mucous membrane, must receive attention.

When the symptoms appear to be confined to the eyes and anterior portion of the nose the source of the irritation will usually be found in the sensitive area of Sajous, which he has described as the region of the anterior extremity of the middle turbinated bodies or the middle turbinated bodies themselves. There will be found a hypertrophy of one or both of these bodies so that there is close contact with the septum or the upper portion of the lower body. This latter form of contact is often overlooked but may be discovered by passing a bent probe between the middle and lower bodies. Cocain may reduce the engorgement somewhat, and will enable the operator to locate the hypertrophy, which will usually be granular or corrugated in appearance. Or cocain may fail to reduce it and the body will remain large and red. When this condition is found no treatment will take the place of the snare, and sufficient tissue should be removed to give free surfaces, no contact and good drainage. There will usually be found accompanying this condition of the middle turbinated bodies a soft hypertrophic area on the septum, just anterior to the previously mentioned point of contact of the turbinated body. This should be cauterized deeply. This particular hypertrophy is often neglected and will continue to be a source of irritation if not reduced. It has been said that these hypertrophies of the septum should not be cauterized, but I have never failed to get good results from the procedure.

When the symptoms are severe and involve the throat and ears, and are accompanied with asthma, then probably the source of greatest irritation lies in what Dr. J. N. Mackenzie has described as the posterior ends of the lower turbinated bodies and the surface of the septum opposite. This is called "Mackenzie's sensitive area." The posterior end of the lower turbinated body is usually hypertrophied and may be called the sensitive hypertrophy. It may be seen in most cases by posterior rhinoscopy, having a granular or corrugated appearance, large and pale. The shortest branches from Meckel's ganglion supply this area, and stimulation or irritation being reflected through any of the branches and connections will produce the symptoms of hay fever.

The most pronounced benefit will be given by treatment of these sensitive hypertrophies. Often the symptoms are immediately relieved when these areas are properly treated. The most appropriate treatment for this hypertrophy is also the snare, after complete anesthesia with cocain. The operation should occupy a few minutes, so that there will be but little hemorrhage. When the snare can not be used I cauterize in one of two ways, preferably by the galvano-cautery, using an electrode which I have had made with a loop to hook over the projecting hypertropic tissue. Or, what has given me the very best results, is the use of chromic acid on the end of a bent probe, so as to reach over the surface of the posterior end of the body, which can not be done with a straight probe. Care must be taken not to touch the tissues near the Eustachian orifice. This treatment will be followed by considerable reaction with discharge, but when the healing process is complete the hypertrophy, as well as the irritability, will be reduced. Some of the most intractable cases of asthma are cured by removal or cauterization of these hypertrophies, removal of the polypi or other intranasal irregularities, which irritate this sensitive area. Also, some of the worst symptoms of chronic rhinitis are quickly relieved when treatment begins at this point. The chronic alternate congestion of the turbinals, as well as the profuse discharges, subside. The bodies are then left to their proper sympathetic influences, which regulate the secretion of fluid and other functions of the nasal mucous membrane.

It has been shown that when simple hypertrophy is the cause of nasal obstruction and the bodies are deeply cauterized their contraction is often so great that inspired air is not properly warmed and moistened, the throat becomes dry and the patient may be in a worse condition than before. In catarrhal areas not truly hypertrophic, deep and destructive cauterization for the purpose of button-holing the membrane to the bone, to prevent erection of the turbinated tissue, is wrong in theory, never necessary and does actual harm. Diagnosis must be made by aid of cocain, which reduces the engorgement and at the same time brings out clearly the flabby, corrugated, true hypertrophy, which alone must be treated.

In the treatment of these hypertrophies, all obstructions, such as polypi, deflections, ledges, spurs and anterior hypertrophies, should be removed in order to gain easy access to the post-nasal regions, and to make the nasal cavities conform to the ideal nose at least in point of drainage and ventilation. For the cure of hay fever the treatment of these most sensitive areas and other very radical departures from the normal should be completed before the beginning of the hay fever season, then, during the season, medical treatment and other measures rigidly carried out will insure success.

Internal medication is not needed in every case, as local treatment of the nasal irregularities is often sufficient, but when it is required it will assist greatly in the relief of the irritability of the nose and general symptoms. The great majority of cases of hay fever are certainly easily curable if tact and patience are employed with the treatment.

I have omitted the discussion of a neurotic condition peculiar to this disease for the reasons that when a frost occurs or when the patient is transported to a place where the atmosphere is free from all irritating qualities which cause the symptoms, all the phenomena of the disease cease almost immediately; also, when the blood is freed from impurities, uric acid and other waste matters, by the treatment above described, the symptoms are quite, if not entirely, controlled; also, that neurotic remedies have not the slightest perceptible effect on the progress of the disease.

Dr. J. O. Roe, in an article on "Hay Fever" (*New York Medical Journal*, Sept. 3, 1887), has ably described the proper treatment of the intra-nasal conditions, and closes his article with the following conclusion: "That by carefully correcting all abnormal conditions found in the nasal or other portions of the respiratory passages, and the use of such systemic medication as may be required to remove any associated or consequent general derangement, we need not fail to cure hay fever."

Dr. Roe, however, gave no outline for internal medication, or what particular conditions were to be remedied by it. He reported thirty-six cures out of a total of forty-four cases by local treatment. From the nature of the disease it will be admitted that a permanent cure must come from treatment and relief of the excessively sensitive nasal mucous membrane and that cure will be hastened and the patient made comfortable during the treatment by internal medication. I believe that every case is curable by the combined treatment.

I report a few cases, with what seemed to be the most appropriate treatment for each case:

Case 1.—Miss I. M., aged 22, has had hay fever for the past three years. Her treatment consisted of chromic acid cauterization of the posterior ends of the inferior turbinated bodies and trichlor-acetic acid applications to the anterior extremities of the middle turbinated bodies, done during the season, with complete cure.

Case 2.—Mrs. N. H. has had a most severe case of hay fever extending over a period of twenty years. The nasal mucous membrane was greatly hypertrophied and very sensitive. I removed and cauterized the hypertrophies until I could find no more to treat. She still had some hay fever irritation but was greatly improved. Doses of 0.65 gram of salicylate of soda with each meal completed the cure for last season.

Case 3.—Mr. H. W., aged 39, with a rheumatic diathesis, a year ago developed hay fever, but has had no recent treatment for abnormal nasal conditions. During the past season the symptoms of hay fever were kept under entire control by salicylate of soda and alkalin diuretics, but if they were discontinued for a few days the symptoms would return.

Failure to cure undoubtedly arises from placing our reliance in a single line of treatment, to the exclusion of other supplementary measures, or inefficient intra-nasal treatment. There are hardly two cases alike and each should be studied for the best method of relief.

92 State Street.

PHYSICAL DEFECTS IN PUPILS.

Read at the Annual Meeting of the Associated Minnesota School Boards, held at St. Paul, Dec. 30, 1897.

BY FRANK ALLPORT, M.D.

PROFESSOR OF OPHTHALMOLOGY, CHICAGO POLICLINIC, ETC.

CHICAGO, ILL.*

I will take up that phase of the subject which deals with the problem of how best to preserve the eyesight of school children, a theme which is pregnant with importance. The prosecution of this subject opens up a wide field, involving not only those elements or conditions, which primarily and particularly bear upon ocular hygiene, such as print, lighting, etc., but also bear upon those circumstances obtaining during the school life of the child, which can either directly or indirectly affect the preservation or degeneration of his eyesight. Such consideration will lead us into a discussion of architecture, buildings, location, window space, lighting (natural and artificial), seats, desks, walls, blackboards, maps, charts, paper, slates, printed matter, writing, etc.

The importance of this topic may be imagined, when we consider that James H. Blodgett, in 1890, estimated that over fourteen million children were in attendance in the different schools and colleges of the United States. When we consider that the average of children possessing defective eyes in our schools is estimated to be from 25 to 30 per cent. it will be seen that at least three and one-half million children attending school in the United States possess defective eyes. It will thus be seen that the magnitude and importance of the problem, as to how best to subserve the ocular interests of this great number of school children, is enormous.

The consideration of defective eyes as a consequence of school life, was first publicly noticed by A. G. Beer, who, in 1890, published a treatise on "Healthy and Weak Eyes." He was followed, in his investigations, by Ware, Szokalski, Shurmayer, Jaeger, Reuta, Reck, Alexander, Gaertner, Cohn, Risley, Randall, and others. I, myself, have superintended the examination of over 10,000 pupils, in the Minneapolis public schools, the past year, by the method which I proposed in 1895. The Minneapolis tests have shown an average of 32 per cent. of children possessing defective eyesight. In all, between two and three hundred thousand children have been examined, according to different methods, in the schools of the world, and the percentages arrived at in Minneapolis are about the same as those obtained in other examinations, although in some of the German universities, where bad print, studious habits and hereditary influences are prominent, from 50 to 75 per cent. of ocularly defective students are not infrequently observed. The objective point obtained by these researches is the inevitable truth that myopia or short sightedness, or an elongated, softened eyeball, is the principal pathologic condition of the eye, induced in children by study, and that the more imperfect the conditions under which the child studies, the more surely, steadily and rapidly will myopia develop.

The frequency of myopia in students has led some observers to believe it to be a natural evolution of tissue, incident and similar to the natural expansion and enlargement in other tissues of the body. These deductions are inaccurate and can not be substantiated. Such superficial observers evidently forget that the natural evolution to which they refer is practically a class evolution, and is found principally among students, or at least among those who attend school and use their eyes to a greater or less degree for the purpose of acquiring an education. Evolution of this kind does not exist to any great extent amongst those whose occupations are essentially separated from those of an educational nature. In other words, ocular examinatians among uneducated farmers, Indians and others, who practically never read or study, show the myopic eye to be conspiciously infrequent. People of such classes undergo evolution of tissue quite as much, and perhaps more so than the student, yet it is in the latter class that the elongated, softened, myopic eye plays such an important role. Myopia, therefore, while not confined to students, is especially frequent in them, and must inevitably be classed as a pathologic condition, and not a physiologic evolution, and is, unquestionably, principally caused by confinement and the more or less injudicious use of the visual organs. In other words, a myopic eye is a diseased eye, and should always be regarded and treated as such. The frequency of myopia has also led some observers to believe that a slightly myopic eye is the normal eye. This claim can not be substantiated, for a great number of observations have shown that the natural condition in infancy and early childhood is either emmetropia or hypermetropia.

Myopia is rarely seen before school life commences, some observers even claiming its non-existence in very early childhood. Its frequency steadily increases during school life, from class to class, and from room to room, and hypermetropia diminishes in proportion

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to the advance of myopia. Some authorities believe that myopia is not hereditary, only the tendency to myopia, and that this inherited tendency is augmented by certain abnormal and inherited shapes of the skull, socket, etc. While the infrequency of actual inherited myopia must be admitted, the statement that it is an absolutely uninherited condition is too sweeping, and the observation of whole families of myopic parents and children, which come under notice, from time to time, must convince an unbiased observer that myopia is a condition possible of transmission from one generation to another. If school life, with all its incident evils is capable of producing myopia, then it must be equally true that a mitigation or a removal of these evils, must be capable of decreasing the number of myopic children. That this is true, is amply proven by statistics gathered in this country and in Europe, where the proper correction of myopia by glasses, the erecting of more properly and abundantly lighted schools, the improving of desks and seats, the changing of curriculums of study, etc., have unquestionably diminished the percentage of myopes in a given community. In investigating this subject we are, therefore, not chasing an interesting scientific fact, but we are endeavoring to arrive at some truthful deductions which will enable us to improve the ocular conditions of the coming generation.

The public schools of the United States are the crowning glory of this country. When we glance back at our own childhood days, and remember the hot, stuffy rooms, with their meager and poorly directed illumination, and the other unhealthy and unpleasant conditions and methods of obtaining a common school education, and then pass through some of the beautiful school buildings of our cities with their cheerful and pleasant surroundings, their teachers and general facilities, we can not but see that the public school system has improved and is improving steadily, and that educators are eager to accept suggestions that will still further improve this system and render it as near perfect as possible. While I am well aware that the curriculums of study at present in vogue in our public schools are much less severe than those which formerly obtained, I believe them still to be excessive, and that they must inevitably, frequently tax, not only the ocular, but the general health of students, especially those of weakly tendencies. I believe that a lengthening of the time required to secure a high school degree, by one year, would mitigate the severity of study all along the line, and enable scholars to emerge from their graduating exercises in better physical and mental condition, and would do the greatest good to the greatest number. I believe, besides this, that a more elastic curriculum is necessary to favor children having poor eyes, and poor health. The strictness of the grades should be modified, at least, and permission given for individual studies to be taken in quantities somewhat adaptable to the health of given individuals. Credit should be given for such studies, as they are finished, and the child allowed to graduate when all of the required studies have been completed. I am well aware, that this arrangement is not infrequently made in our public schools, but I think that such a course is not encouraged, and that children are made to feel a sense of mortification because they are falling below their grades or classes. I think many of the children should belong to *no* grade or class, but be allowed to acquire their education, study by study, in a manner consistent with the proper development of the health. I do not mean to advocate the abandonment of grades and classes. This would be most unwise and undesirable, but I do feel that children with impaired ocular or general health should be cheerfully and creditably, not only allowed, but *advised* to take only such numbers of studies as will be consistent with a proper physical development. Such a course would lengthen the period of school life in many instances, but it would improve the average health of scholars, and this is of greater importance. Children should not be required to take so many studies that they have to work up two or three at home in the evening. If they study the major portion of the day, a growing and developing child should not be required to give up that mental and physical relaxation incident to an evening spent pleasantly at home amid sports, games, music light literature, etc. I do not mean to say that children should do no studying at home of an evening. A little study is not only harmless, but beneficial, but some children are compelled to work up three or four studies at home, and this is excessive. Work of this kind resulting in close confinement, bad atmosphere, and perhaps poor illumination and utter disregard of hygienic study methods, results in a lack of that refreshing sleep necessary to the proper nervous, mental and physical development of the child. However much care is manifested in the schools concerning the proper use of the eyes, it is difficult to regulate such work at home. Therefore the amount of required eye-service at home should be limited. The teacher never knows how the scholar learns his lesson at home. He may study lying down by a poor light, or face a brilliantly lighted lamp or gas jet for hours, or indulge in other habits injurious to proper ocular health. Children will also use their eyes in devouring light and sensational literature, impressed upon the poorest paper, with the poorest type and the poorest ink; and while we may wish to stop this evil, we must be aware of our inefficiency in accomplishing our desires. If this be true, and children's eyes will be abused in a manner that is thoroughly beyond our control, we must make some allowance for it and not impose too much ocular service at home, incident to the acquiring of an education. Ocular strain in schools can be much mitigated by frequent change of occupation, which may not be always a recess, but may be something in the nature of exercise of various kinds, such as calisthenics, gymnastics, marching, etc. Much improvement has been made along these lines of late years, but there is further room for improvement. Such changes have become quite a feature in many German schools, where ocular degeneration has become recognized and steps for improvement inaugurated. Statistics from some schools have shown that since frequent breaks of various kinds in the school session have been made, the ocular condition of students have manifestly improved. The semi-annual term examination for the determination of class standing is often detrimental to the eyes and health of students. It is a semi-annual period of intense, concentrated and continuous study, which often leaves in its wake impaired eyes and health. Can not some means be devised whereby these periods of over study and anxiety may be abated, and the standing of students secured in other ways, such as class records, quizzes, reviews, etc?

The architecture and location of school buildings is of great importance. Suitable and healthy loca-

tions should be obtained as far as possible. In cities, the nature of the soil is not always possible to be taken into consideration, nor is it so important, as city buildings are usually thoroughly well drained and plumbed. In the country, however, a well drained location should be chosen, without a clay sub-soil, and remote from malarial and other injurious environments. In cities, narrow streets with high buildings should be avoided, as they shut out the light and proper ventilation. School buildings should be away from factories, markets, etc., to avoid their distracting noises, exhalations dust, etc. Ample grounds should be secured, upon all sides of the building, not only for maintaining proper air, light, etc., but in order that children may have plenty of room for games, etc., which are so conducive to the proper physical development of the child. Large, well lighted and dry cellars should be had for recreation on stormy days, and, where it is impossible to obtain a large tract of ground for the school building, it has been suggested that a flat roof be built with high surrounding walls and a roof garden be laid out in which children may play. The question of sufficient light in school buildings is of vital importance. To obtain this, other buildings should be at a distance equal to twice their height from the school building. The illumination of a school room should be of a quantity and quality that will amply light every portion of the room on a dark day. To secure this, the window surface should not be less than one-fifth or one-sixth of the floor, and the direction from which the illumination comes is a matter that is not particularly essential, although a north light is the steadiest and most constant; but many observers and teachers dislike it on account of the lack of sunlight, which they claim to be detrimental to the health and spirits. Scholars compelled to study by poor illumination will be found to carry the printed page close to the eye, in order to increase the quantity of retinal illumination, or to take advantage of the law that the illumination diminishes according to the square of the distance. This forces the accommodation and convergence of the optical axes, and causes undue congestion of the eyeball and surrounding tissues, which increases intraocular pressure and softens the coats of the eye, thus permitting an elongation of the optical axis, and the production of myopia. Windows should be at the side of the room, preferably the left side, and at the back. The lower portion of the window should be about three feet from the floor and extend to the ceiling, in order to obtain as much window space as possible. The margins of the window ledges should be beveled, both inside and out, to avoid shadows, and should not be placed on both sides of the room, as it would result in a confusing and injurious cross-light. There should be as little wall space on the sides where the windows are placed as possible, and the windows should be hinged at the top, in order to obtain proper ventilation without direct draughts. Blackboards should not be placed between windows, as it taxes the eye exceedingly to endeavor to decipher marks made upon a blackboard thus situated. The ceilings of a school room should be high, in order to secure good light and ventilation. Artificial illumination should be of a good quality and sufficient in quantity. A profusion of incandescent lights with glazed globes, grouped at frequent intervals, is the best illumination that can be secured, as it is white in character, intense in quality, and does not heat or vitiate the atmosphere. In order to carry out the idea of a light school room, the walls should be painted in delicate shades of yellow, green, blue or light gray. The blackboards can be covered when not in use by light colored shades, of a similar color to that of the walls. The woodwork, desks, etc., should be all of light colored wood, in order to preserve as much illumination as possible. Window shades should be light colored, and should roll from both the top and bottom, with the possibility of their being long enough to roll up or down the full extent of the window surface.

The seats and desks is an item of great importance, and was first publicly mentioned by Henry Barnard in 1860 He pointed out the necessity of placing the seats close to the desks in order to avoid leaning forward. Seats and desks should be arranged in such a manner that the soles of the feet will rest securely upon the floor, and so that the erect posture is the most natural and the easiest for the scholar to assume. In order to obtain this the seats should be as wide as the thigh is long, measured from the inner bend of the knee to the back. It should be level and slightly concaved to prevent slipping forward. The front edge of the seat should be placed from one to two and a half inches underneath the inner edge of the desk. The top of the desk should be inclined toward the pupil at an angle of about 10 degrees, and must be low enough to allow the forearm of the pupil to rest lightly upon it without raising the shoulder when in the act of writing, but sufficiently high to avoid the necessity for stooping in order to reach it. The lower part of the back and pelvis should be supported by a rest easily felt while sitting upright. It seems almost unnecessary to state that desks should be of different sizes to suit the pupils, and yet I have frequently looked into schoolrooms where but little attention was paid to this point. Some of the manufacturers construct desks in such a manner that by the adjustment of screws, etc., every desk in the room can be made of a proper size to any child who will be likely to be in that particular schoolroom. By using desks of this kind, the fitting of scholars to their desks will be an important procedure at the commencement of each school year. Of course, proper desks or seats will not solve the problem, some children have weak backs or are otherwise bodily affected and seem truly unable to sit in a schoolroom without half reclining upon a desk, and it is questionable whether children of this kind should be required to attend school sessions steadily. Other children are lazy and slouchy in their habits, and this will call for frequent admonishment on the part of their teacher.

Blackboards should be kept clean and have unglazed surfaces, and the figures, lines, etc., that are marked upon them should be of a size and character that can be easily seen without straining the eyes of the pupils. Some authorities have recommended the use of white boards with black chalk instead of blackboards with white chalk, as black figures on a white surface can unquestionably be seen easier and farther than white figures on a black surface. I think a majority of practical educators, however, believe that the white boards with black chalk are extremely objectionable, on account of the constant and distasteful soiling of the hands. If the blackboards are kept clean, the white crayon marks will be found to be sufficiently legible for all practical purposes.

Slates are justly becoming unpopular in schools, whether they be black or white, on account of the

foul and unhealthy condition in which they become. If slates are used, however, the white slates are to be preferred, as the black marks upon the white surface are much less trying to the eye than the faint gray marks of the pencil upon the old-fashioned slates. The best material with which to perform this kind of work is whited unglazed paper and black ink, with a stub pen capable of making heavy strokes. Maps and charts are important articles of school furniture and easy to teach with, if the marks upon them are large and legible. The groundwork upon which such maps are printed should be of a white or yellow color, as characters printed upon dark shades, such as red or blue are not so easily distinguished. The study of geography as taught by hand atlases, with varied colors, lines, figures, printing, etc., is very trying, and is probably more injurious to the eye than any other study. Great care should, therefore, be taken in the printing of geographic text-books and maps, and such books should be chosen by school authorities as will be least injurious to the visual organs of the child.

The manufacture of text-books for schools is a subject of great importance. Books should be of a size that can be easily handled, and the paper used in the construction should be of good quality, non-translucent, reasonably thick and of white or cream color. The printing should be first-class in every particular. The letters should be black, clear and of sufficient size for easy reading. The lines should have good distances between them. Long lines should be avoided, as extra accommodation is required to follow them, and if a page must be wide it is better to divide its contents into columns.

A great deal of discussion has lately arisen as to whether the slanting handwriting heretofore taught in our schools should be continued, or whether scholars should be instructed as to the methods of acquiring an erect handwriting. Fahrner, in 1897, said, "we allow our children to grow crooked in order that their handwriting may be nicely slanted." There can be no question but that vertical handwriting is less injurious to the eye than the slanted variety. In writing after the vertical method, the paper is directly in front of the scholar, and therefore the page is seen equally well with both eyes, which will accordingly work together. Besides this, the strokes are stronger and less hair lines will be seen than in the slanted variety. Besides, the vertical method of writing favors upright sitting, which is in itself a sufficient reason for its adoption.

The tendency to lean over while sitting at the desk is very strong with some scholars, even though the school authorities have provided them with proper desks and seats. To obviate this tendency, many forms of head rests or face rests have been suggested, and of them all Kallman's face rest is probably the best. These rests are fastened to the desk and assume a vertical position with a loop at the extremity through which the face emerges. When these rests are fastened into the desks it becomes impossible for the child to lean over when reading, and many German schools have adopted Kallman's face rests with the utmost satisfaction.

The method which I proposed in February, 1895, for the detection of most ocular diseases in children, together with measures for their relief, is doubtless familiar to all. I have from time to time modified the original plan until I believe it to be now as nearly as perfect as such a plan can be in our American public schools.

The statistical papers and warning cards now in use in the Minneapolis schools are now used quite generally throughout the United States, and are giving satisfaction wherever tried. The results have been distinctly beneficial to the coming generation, and in Minneapolis the plan is in great favor with teachers, scholars, parents and the public at large, and has been productive of benefit to thousands of cases, especially since people are learning that the tests are for the development of most all ocular diseases and not merely for the fitting of glasses, and since they have also learned that an eye doctor and not an optician is the proper person to consult if a warning card is deemed a necessity.

Those aural diseases which will be most frequently observed by teachers are running or matterating ears and deafness. The former are usually produced from blood diseases, inherited or acquired, from catching cold or from catarrhal affections of the throat and nose. They can usually be detected by the teacher if the child complains of earache if care is taken to look into each ear, as far as possible, by a good light for the detection of matter or pus, or if either ear emits a foul odor. If any of these conditions obtain, the child should be advised to consult an aurist.

I would recommend that the following questions be added to the statistical blanks now in use in the Minneapolis schools:

1. Does the pupil frequently complain of earache in either ear?
2. Does matter (or pus) flow from either ear?
3. Does a foul odor proceed from either ear?

If an affirmative answer obtains from any of these questions the child should be sent to an ear doctor, as often questions not of diseased ears but life and death itself are at issue. The examination for odor will be most distasteful to some teachers, and under such circumstances it may be omitted.

A deaf child is an apparently stupid child and is deprived to a greater or less extent of an important sense which was intended as one of the means of obtaining a knowledge of the world. He is therefore unequally equipped for the battle of life and obtains an education disadvantageously, and is frequently called stupid, listless and unambitious, when in reality he is merely deaf. The time to relieve such conditions is in early life while physical tissues are pliable, and not in later years when relief is improbable and cure well nigh impossible.

Deafness may be due to the presence of a matterating (or purulent) ear with its destructive tissue changes, which causes will be developed under the set of questions just enumerated, or it may be due to catarrhal conditions or changes of the throat, nose or Eustachian tube. One of the most frequent causes of deafness in children is what is known as adenoid vegetations in the vault of the pharynx, or enlarged bunches of tissue growing from the upper portion of the throat and interfering with the proper inhalation and exhalation of air through the nostrils, and the proper aeration of the middle ear through the Eustachian tubes. The same unfortunate conditions exist frequently in children possessing abnormally large tonsils. Children of this kind are apt to become deaf and develop into what are known as "mouth breathers," because they habitually breathe through their mouth instead of their nostrils, giving them a peculiarly stupid and vacant appearance. The improper aeration of the air passages predisposes to lung

diseases, and the perpetual expansion of the mouth and the lack of nasal breathing produce a lateral contraction of the nose and vault of the mouth which, together with the contracted upper lip, gives to the countenance a characteristic appearance, which once seen is not easily forgotten. Almost inevitably a child with such a physiognomy is more or less deaf and has throat or nose obstructions, or both. Other catarrhal conditions may cause deafness and frequently do, but such events occur more frequently in adults. The deafness of children is usually dependent upon organized nose or throat obstructions. These conditions can be easily detected by an unprofessional observer by the appearance of the child and the asking of a few simple questions.

Before suggesting these questions let me say that while there are many tests for hearing, only two seem feasible for use in school examination, viz., the spoken voice and the tick of a good sized watch. To use the former the child's back should be turned to the teacher, and an assistant should plug up first one ear and then the other with a cloth over the finger. The teacher should then step away about twenty feet, and ask the child in a low but distinct voice, a direct question, requiring a direct answer. If, after one or two tests the child fails to hear the spoken words in either ear, he should be sent to an ear doctor. He should be further tested in the same way in both ears, by the tick of a good sized watch, which should be placed six or eight feet away, and gradually moved toward the child, on the side upon which he is being tested. The watch should be heard at least three feet away, and if it is not heard by both ears at that distance, the child should be sent to an ear doctor.

Having now shown you how hearing may be simply tested, let me suggest some pertinent questions, to be added to the statistical blanks previously recommended, which will develop the existence of the abnormal conditions, which I have endeavored to briefly describe:

1. Does the pupil fail to hear a low and distinct voice, at twenty feet, with each ear?

2. Does the pupil fail to hear the tick of a good sized watch at three feet, with each ear?

3. Can matter be seen flowing from either ear, or does a foul odor proceed from either ear?

4. Does the child fail to breathe freely from either nostril, when the other nostril is closed with the finger?

5. Is the child an habitual "mouth breather"?

If an affirmative answer is given to any of these questions the child should be sent to an ear doctor.

The results of intelligent treatment upon such diseases in children are exceedingly satisfactory, and if the young sufferers can be placed under proper care sufficiently early, an immense amount of good may be accomplished to the coming generation.

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THE BEST METHODS OF SURGICAL STERILIZATION.

Presented in the Fourth Annual Meeting of the American Academy of Railway Surgeons at Chicago, Ill., Oct. 6-8, 1897.

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It is indeed very fortunate that the surgical bacteria are, comparatively speaking, so little resistant that surgical sterilization can be reduced to such a degree of simplicity that it may be carried out on short notice, not only in hospitals, but also under the open sky, not only in private practice, but also in offices, by reasonable means and in reasonable time. While surgical sterilization is open to improvement and does steadily improve, it is a source of some regret that the best methods of accomplishing surgical sterilization are still somewhat in dispute.

If I am justified in considering the various manuals on this topic, as standards for the teachings and practice of surgical sterilization in the respective countries, we have three principal schools before us: 1, the English school, which practically teaches the destruction of pyogenic, consequently non-spore-bearing bacteria only. (W. Watson Cheyne: "The Treatment of Wounds, Ulcers and Abscesses," Philadelphia, 1895); 2, the German school, which advocates the extermination of all surgical bacteria, spore-bearing or not, pyogenic or not. (C. Schimmelbusch: "Anleitung zur aseptischen Wundbehandlung," Berlin, 1893); 3, the French school, which in reality aims at the destruction of all kinds of bacteria, pathogenic or not, consequently not only at surgical but also at bacteriologic sterility. (Felix Terrier and M. Peraire: "Petit Manuel d'Antisepsie et d'Asepsie chirurgicales," Paris, 1893.)

The practical result of these three different views is, that the Englishman is perfectly content with chemical sterilization, while the German considers thermic sterilization the best method, as does the Frenchman.

If the Englishman is right he has the advantage of the simplest method of sterilization, as almost everything is prepared with the aid of a cold solution of carbolic acid; if the German is right, and he has at least the sympathy of the majority of surgeons, sterilizers for boiling water and for ordinary steam, which the Englishman has no use for, are indispensable; and if the Frenchman is right, surgical sterilization will never become popular outside of hospitals, as his sterilizers are both expensive and cumbersome, as they are constructed for high pressure.

Surgical sterilization means, naturally, destruction of surgical bacteria, and is a part only of asepsis, which means absence of all septic material, consequently not only of bacteria, but also of impurities of a chemotactic nature. In our surgical work we aim consequently, not only at sterility but at cleanliness (atoxicity) as well. This fact is admitted by all schools, and mechanical sterilization is therefore recognized as a preliminary measure of the highest importance. Chemic and thermic sterilization can not satisfactorily cleanse all our various articles; on the other hand, mechanical sterilization is not able to sterilize them perfectly, although this last method removes the majority of the bacteria at the same time that it makes the articles atoxic.

While it is of some importance to remove chemic impurities of all kinds, and all schools, therefore, indulge in washing, scrubbing, scraping and shaving, and while mechanical sterilization at the same time means at least three-fourths sterility, we must insist upon complete destruction of our real enemies. The question now is, is it enough to destroy the less resistant pyogenic bacteria (English), or is it necessary to remove and kill all known surgical bacteria and their spores (German), or finally, should we endeavor to obtain a real bacteriologic sterility (French)?

It must be admitted that failures in our surgical work, because of imperfect sterilization, are invariably

due to sepsis, *i. e.*, to the action of pyogenic, not spore-bearing bacteria.

Only once or twice have we heard that the patient died from anthrax or tetanus. When did we hear that our patient succumbed to tubercular infection because of faulty sterilization? Of *vibrion septique* (malignant edema) the same may be said. It is always sepsis, and so far the Englishman is, in my opinion, practically right when he claims that surgical sterilization of these bacteria is enough. Could we only rest assured that chemic sterilization would accomplish this in a practical manner, there would be no need of thermic sterilizers requiring proper apparatus and heating plants.

But fascinating as chemic sterilization is, severe criticism may be entered against it. The stronghold of chemic sterilization is by no means surgical sterilization but antiseptic surgery, which forgives a good many minor surgical sins and shows clemency to gross mistakes. Antiseptic surgery cripples bacteria for some time without destroying them completely, thus giving nature time to organize the defense and prepare for the offensive. But it must be remembered that chemicals are disposed of in the organism sooner than bacteria, and as long as we do not possess a non-irritating chemical which will stick to the tissues until the process of repair is finished, antiseptic surgery can not replace surgical sterilization. When the Englishman claims to obtain just as good, indeed better results, with chemic sterilization than those who prefer thermic, and if there is any truth in such a proposition it must be due to antiseptic surgery and not to chemic sterilization. There is no objection to judicious antiseptic surgery as every operation of some length includes infection of some degree, and if everything has been properly sterilized mild antisepsis only is required, and the milder the antiseptic procedures are the better, as all chemicals are necessarily more or less cell-poisons, the more so the more concentrated they are. Good surgery can undoubtedly be done by poor surgeons with the aid of chemicals; good surgeons have use for them only to a limited extent.

Seen, therefore, in the light of antiseptics, chemicals are of great value; seen in the light of germicides, they have a very limited field in surgical sterilization. Nobody denies that certain chemicals are germicides in a proper concentration, but they have no immediate action. Watson Cheyne makes this statement: "we may take it as an axiom that any substance which is thoroughly soaked in a 1 to 20 carbolic acid watery solution for twenty-four, or say forty-eight hours is absolutely disinfected." This, if true, means nothing more nor less than that chemic sterilization is impracticable.

The bacteriologist has not as yet been able to settle the question of the germicidal action of any given solution on pure cultures of surgical bacteria and probably never will, as it is almost impossible to eliminate the chemical before the test thread, or whatever is employed, is transferred to the culture medium. The action of chemicals must be studied in the operating room, but if a certain chemical appears to work satisfactorily there, like carbolic acid in the English hospitals (Cheyne), the only conclusion we may draw is, that antiseptic surgery is justifiable, but not that chemicals are germicides.

Chemic sterilization is very slow under the best circumstances, injurious to our surgical materials, unpleasant to the surgeon and even dangerous to our patients. "The chemic method of disinfection is therefore a make-shift and is only to be employed for certain materials and in certain conditions" (Kocher). Every sensible surgeon will indorse the statement of the eminent Swiss surgeon, and employ heat in some form or other whenever it is possible, as thermic sterilization is our best means of disinfection, having the important advantage over chemic sterilization, that it is mathematical, leaving no difference of opinion between the surgeon and the bacteriologist, and no doubt as to its reliability.

Thermic sterilization may be more complicated and expensive than chemic, as proper apparatus and fire are necessary, but what little we spend in money we gain in time, as this kind of sterilization acts in as many minutes as the chemic does in days; and to know that we, in a given case, have fully complied with the strictest laws governing thorough sterilization is a great satisfaction. Those who prefer antisepsis to asepsis can not possibly have any objection to asepsis itself, as they can supplement it with antisepsis at their pleasure and very easily, and it is a wonder to me that the English school will not see the great advantage in such a combined method.

Boiling water is the first, last and best sterilizing agent in surgery. Steam ranges next to boiling water, while hot air is only effective when its temperature is raised to the neighborhood of 300 degrees F. and continued for hours. The only trouble of any importance with thermic sterilization is, that it can not be employed for all purposes; but wherever it is applicable heat should be used, and I believe it to be little short of carelessness to neglect this method when the circumstances otherwise permit of its employment. Sterilization, pure and simple, as it is effected by heat only, does not make good surgeons and is dangerous in the hands of poor ones, who can do better with antiseptic surgery. The mixed method, mechanical and thermic sterilization combined with judicious antisepsis, is recommendable to all surgeons, good as well as poor.

Having considered the different methods of surgical sterilization in general as to their real superiority, let us now take up some of the most prominent details with reference to the best methods to be pursued.

SKIN STERILIZATION.

English method.—This includes shaving, scraping, thorough washing with soap and a mixture of 1 to 20 carbolic acid lotion containing 1 part in 500 of corrosive sublimate in solution, saturation of the surface with turpentine and then again thorough washing with soap and the above mixture, employing a nail-brush; a five minutes performance.

German method.—This requires shaving, scraping, washing and brushing with soap and warmest possible water, then drying with sterile gauze, saturation with 80 per cent. alcohol and brushing with 1 to 2000 sublimate solution.

French method.—This is accomplished by shaving, scraping, washing and brushing with soap and sterile (filtered) water, saturation with ether and then brushing in a 1 to 2000 sublimate solution.

There is evidently not much difference in these three methods, and they appear to be equally elaborate in spite of Watson Cheyne's insinuation that "abroad disinfection of the skin is a very elaborate process." It is admitted that thermic sterilization can not apply to the skin; it is likewise admitted that the best

methods of disinfection of the skin are the mechanical removal of the impurities, but when Cheyne in admitting this writes, "and this can only be done by the application to it of suitable antiseptic substances," it is difficult to know what he means.

In cleansing the skin mechanically it is but common sense to use the warmest possible water. It is likewise but common sense to use sterile (and running water if procurable). As to turpentine, alcohol or ether, I believe it is the intention of the different schools that they shall add to the mechanical disinfection by their ability to dissolve impurities of various kinds, and they certainly do this, turpentine first, then ether and alcohol last, but it is supposed that they will exhibit an antiseptic property as well. In this respect also turpentine ranges above the others, alcohol coming last.

Whatever may be the case experience has shown that turpentine, ether and alcohol are very valuable agents in the disinfection of the skin, and I do not think it makes much difference which one is preferred. The modus operandi is, however, not very clear. As ether and alcohol act very unpleasantly on my own skin, I have of late taken up the English idea with turpentine, but the few seconds the skin can stand saturation with turpentine is so short that I can not possibly attribute any antiseptic influence to it. It cleanses the skin beautifully and leaves a coating of resin, to which I attach much importance, and mainly attribute its beneficial influence. For years I have been in the habit of impregnating the skin with sterilized lanolin as the finishing touch, in order to return to it in a sterile form what I have deprived it of in an infected one, and at the same time cover up the deeper-seated bacteria. Turpentine dissolves the fat, but in return it varnishes the skin and covers up the bacteria more perfectly than lanolin, and we can understand how water does not take effect on the skin treated with turpentine. I am inclined to believe that this varnishing constitutes the antiseptic properties of turpentine, and that something similar takes place when using ether or alcohol. Turpentine is cheap, convenient and always at hand in proper condition without any special preparation.

As for antiseptics in disinfection of the skin I leave them more and more behind. I prefer lysol to sublimate, carbolic acid and the rest, but I use it before the impregnation with turpentine, as it takes no effect when the skin is varnished. If antiseptics like carbolic acid are forced into the skin they will undoubtedly cripple the deeper bacteria, but if they are liberated during the operation and transferred to the wound, the antiseptic is, as above stated, soon disposed of and the bacteria may revive and thrive in the more or less injured tissues.

The skin can not naturally be properly sterilized through its entire thickness. The surface may be pretty well prepared by mechanical means, so that scrapings will not develop any cultures, but it is vain to try to sterilize the adnexa, and bacteria inhabiting these parts, however few and little virulent they may be, may be liberated during the operation either by perspiration or manipulation, not to mention that the skin of the operation-field exposes bacteria the moment the incision is made. For this last reason it is certainly proper to prepare the operation-field a day or two beforehand, and cover it with an antiseptic dressing in the hope that this prolonged saturation may actually destroy the vitality of the deeper bacteria. The knife ought to be cleansed anew after the skin has been cut through. Covering up of the skin bacteria is not a new idea. Recently it has been revived and thin, delicate rubber gloves have been recommended. I prefer the turpentine process, as I need all the sensitiveness in my fingers nature has given them.

The best method of surgical sterilization of the skin is this: after shaving the operation-field (not the operators' hands), brush the skin with a stiff, preferably sterile brush, in hottest possible, preferably sterile and running water for several minutes; cleanse the nails and repeat the scrubbing (the surgeon who believes in impregnating the skin with one of the ordinary antiseptics, lysol, sublimate, carbolic acid, permanganate of potash, etc., should use it before varnishing with turpentine); dry the skin with sterile gauze, impregnate it with turpentine and remove the oil with sterile warm water or a mild antiseptic solution (antiseptic surgery). The whole procedure ought to consume about ten minutes.

STERILIZATION OF INSTRUMENTS.

English school requires immersion for two or three hours before operation in a 1 to 20 carbolic acid solution.

German school requires boiling for five minutes in 1 per cent. solution of carbonate of sodium.

French school includes prolonged boiling in ½ per cent. carbonate of potassium solution, dry heat, and a variety of other methods.

It is fortunate, according to Watson Cheyne, that a comparatively short immersion in a 1 to 20 carbolic acid solution will remedy any accidental contamination, which may occur after the instruments are taken out of the glass press, where they are kept and where they are in reality pure. And if an instrument during the operation drops to the floor, it is effectually and rapidly rendered aseptic by dipping it for a few seconds in undiluted carbolic acid.

About the two or three hours immersion, Watson Cheyne says that the disinfection is "generally quite satisfactorily accomplished." When a "comparatively short immersion remedies any accidental contamination," why does not the English surgeon stick to the short immersion, which according to the above statement is more reliable than the long one?

At the same time that Cheyne evidently sterilizes his instruments by the aid of carbolic acid, he makes the strange statement that he does not, as a rule, boil his instruments, as he sees no advantage in it. Still he confesses that it is certainly very convenient to have a vessel of water boiling during the operation, in case any instrument, which has not been previously prepared, is required, or in case an instrument falls on the floor, on a blanket, etc.; such an instrument can be immersed in the boiling water for a few minutes, and then be relied on as being thoroughly aseptic. I am at a loss to see the superiority of the English method of sterilizing instruments according to to Cheyne's own statement.

The German method of boiling the instruments for a few minutes in soda solution, is so simple, so convenient, so quick, so little injurious to the instruments and so absolutely reliable, that this method must be considered the ideal one. For that surgeon who keeps his instruments in good order—what we all should do—it is sufficient to pour boiling water on them and let the water cool off. That the addition to

the boiling water of an alkali raises the temperature and prevents rusting is known to all, and it is immaterial if carbonate of sodium, carbonate of potassium or soap is used. Lately I prefer liquor potassæ to other agents, as it gives no precipitate and is always at hand, as we use it in our urinalysis. The instruments come out of boiling solution of potassium bright, clean, sharp and aseptic—undoubtedly the best method of sterilization of the instruments.

It is a source of some regret that we do not command a practical method of keeping our instruments at hand all the time sterile. Many suggestions have been offered, but they have failed to prove acceptable. When, however, we consider that in all cases we will have to prepare our own hands and the patient's field of operation the regret is not of lamentable proportions. The time it requires to prepare the skin is all the time required to sterilize our instruments by the boiling process.

The Frenchmen are extravagant in their sterilization of the instruments, due to the fact that they aim at bacteriologic, while they speak of surgical sterilization. Boiling for half an hour is hardly considered enough; the addition of ½ per cent. carbonate of potassium is looked upon as better; some use hot air, others boiling oil, vaselin, glycerin, etc. Such methods are superfluous and to be rejected when we have simpler ones that have stood scientific and practical tests.

Many find that boiling water is detrimental to instruments, as they become rusty and dull. This is true, if certain precautions are not taken. The water should preferably be rain or distilled water, an alkali should be added, and the instruments not immersed before the water is boiling, and the boiling should not last more than from two to five minutes. To wrap the cutting instruments up in cotton is an additional safeguard. Under these circumstances the instruments will not suffer unnecessarily. But mistakes are continually being made and people are hunting for a safe, quick, chemic method and formalin has come conspicuously to the front, particularly among the oculists. Time will show that formalin has no advantage over carbolic acid or other chemicals. Formalin is a very much over-rated agent and the formalin craze, which has lasted about a couple of years, is fortunately gradually subsiding. Formalin sticks a long time to the various articles exposed to its action, and this circumstance is responsible for the exalted ideas of its sterilizing superiority. Whenever thermic sterilization can be used it is imperative to choose this method on account of its mathematical accuracy. If not practicable, chemicals may be substituted for it as they are better than nothing.

DRESSINGS.

English school.—Gauze is impregnated with antiseptics.

German school.—Gauze is sterilized by ordinary steam (low).

French school.—Gauze is sterilized in autoclave (high steam).

The Englishman sterilizes his dressings by the aid of carbolic acid, corrosive sublimate or both. There is no doubt that dressings may be sterilized by chemcals if they remain long enough in a solution of proper strength. It is safe to say, it requires several days—Cheyne thinks two—for a 5 per cent. solution of carbolic acid to accomplish sterilization; and the same holds good with a 1–1000 sublimate solution. In so far, there is no difficulty in having properly sterilized dressings at hand, when needed. But dressings will suffer by a prolonged stay in the antiseptic solution, and they can produce harmful results locally as well as generally, for which reason they must be wrung out in a weaker solution or sterile water, before being applied. Moreover, as dry dressings are preferable to moist, for well known reasons, it is common for manufacturers to dry the chemically sterilized dressings and put them up in containers. These factory-made dressings, for which there is an enormous sale throughout the world, is a great humbug in spite of the undoubtedly well-meant efforts of the manufacturing houses to make them reliable.

First, it has been proven over and over again that factory-made antiseptic dressings are more or less full of bacteria, as they have been handled by ignorant and irresponsible hands after having been removed from the solution; second, chemicals do not sterilize unless they are in an active form, that means, in solution. This holds pre-eminently good with sublimate gauze, and in all probability, also, with carbolic acid dressings. The oozing from the wound will precipitate the chemicals and make them inert. As for Credé's silver gauze, it remains to be shown if the oozing dissolves the silver and makes it active. Dressings sterilized by chemicals are only reliable when they are conveyed directly from the fluid to the wound.

The factories claim that their antiseptic dressings have been sterilized over again, once or twice, in their containers by steam. As steam must penetrate, condense its moisture, revaporize this, and at the same time expel all air, everybody will understand the great humbug of sterilizing antiseptic goods in containers, which are either impregnable by steam or do not allow the escape of air.

The German sterilizes his dressings by steam at the temperature of boiling water (212 degrees F., low steam). He places the dressings, which have been thoroughly cleansed by washing and dried beforehand, in a steam sterilizer, which is so constructed that the steam enters the sterilizing chamber from above and escapes below, thus expelling all air and at the same time sterilizing every particle of the articles contained. The whole process takes about half an hour and the sterilized dressings are taken directly from the sterilizer and conveyed to the wound without being manipulated by suspicious hands.

Several devices have been recommended to keep such sterilized dressings ready for use all the time. The most simple and practical is that of Bloch: The gauze is wrapped up in a double layer of filtering paper, tied, marked and put in the sterilizer. The steam will penetrate the filtering paper with the same ease with which it penetrates the dressings, thus sterilizing it at the same time. (Steam can not penetrate ordinary paper.) After complete sterilization and drying, the contents of these packages will remain sterile so long as the filtering paper remains dry. Any one can unroll the outer layer, and the surgeon picks out the inner, which contains the gauze. It is strange that the zealous and willing manufacturer of surgical dressings has not taken up this idea, which dispenses with the objection above, that the sterilization process should be the last and not the first one. The market is full of plain sterilized gauze. I will heartily recommend the profession to buy their gauze from these houses, as the gauze has been thoroughly

cleaned, dried and sterilized. But do not have too much confidence in the sterization, but repeat the process in your own sterilizer. The German way of sterilizing dressings has proved to be perfectly reliable, and sterilizers constructed for this process are simple, inexpensive, durable and portable, qualities which enable every surgeon to accomplish his own sterilizing under any and all circumstances. For complete particulars in regard to steam sterilization and steam sterilizers I refer to my earlier writings, to which I have nothing to add.

Steam sterilization of dressings is unquestionably the best method, as in a short time and with very little expense and trouble it makes the dressings perfectly aseptic, and when they are first rendered aseptic it is an easy thing to make them antiseptic, if so desired, by plunging them into an antiseptic, sterile solution, or by dusting them or the wound with an antiseptic powder.

The Frenchman thinks his method of sterilizing dressings is superior to that of the German, because he can expose them to a much higher temperature in his autoclaves (high steam). There is no objection to bacteriologic sterilization of dressings which the Frenchman can obtain, but surgical sterilization, of which we speak, is effected by the German method to perfection; besides the autoclaves are expensive and cumbersome; they are stationary apparatus and do not give the dry dressings that can be obtained in sterilizers constructed on the German principle. Their only advantage, to my mind, is the fine show they make in a hospital and that they may be connected with the pre-existing steam plant, so that no extra fire is required.

SUTURES AND LIGATURES.

English school.—Silk is kept for a few days in 1 to 20 carbolic acid solution. Catgut is soaked in the same solution for at least a week.

German school.—Silk is sterilized by steam or by boiling; catgut by chemicals.

French school.—Silk is sterilized by boiling, first in filtered water, then in antiseptic solutions, and finally steamed in the autoclave. Catgut is sterilized by dry heat.

I have only mentioned silk and catgut as representatives of inabsorbable and absorbable suturing and ligating materials. Silk: As this material can remain in strong antiseptic solutions without detriment almost any length of time it is evident that thorough sterilization can be accomplished in this manner, and consequently there is no objection to chemical sterilization according to the English school of this particular material. But the advantage of having sterile silk present at all times is of doubtful utility. The needle, the needle-holder, etc., can not well be kept in a sterile form, and the surgeon who sterilizes his instruments by boiling will naturally prefer to boil his silk at the same time. It is no advantage in silk sterilized by chemicals that it is antiseptic. The chemical contained in the silk is certainly of minor importance as to poisonous action, locally or generally, because of the small quantity contained; for inabsorbable material it is enough that it is sterile. The best method of sterilizing silk is to boil it with the instruments, but in a separate container. The Frenchman is just as extravagant in his treatment of silk as he is in his sterilzation of all other articles.

Catgut: With reference to this ideal suturing and ligating material, there is no longer any doubt that it can be reliably sterilized, and with comparative ease. But Schimmelbusch, in this one instance, turns his back on thermic sterilization, which he considers very difficult, complicated, and requiring minute surveillance, which prevents its general employment. I commend the Frenchman who advocates dry heat (the method of Larochette).

Catgut can not be boiled or steamed; if thermic sterilization is to be used, it must be in the form of dry heat (Reverdin-Benckisser). If we possess a proper hot air sterilizer in which the temperature can be gradually raised to about 280 degrees F., and maintained for hours, we have a simple and perfectly reliable method of sterilizing catgut. It has been said that catgut sterilized by dry heat is not always perfectly sterile, but if the laws governing dry heat sterilization have been properly complied with, in a sterilizer correctly constructed, surgical sterilization is attained.

There is no doubt that catgut can be sterilized by a variety of chemicals, but as it is, first, antiseptic as well, it is difficult to say what shall be ascribed to the antiseptic, and what to the supposed sterility; and second, it requires days and weeks for the antiseptic, and only hours for the heat to accomplish its purpose.

Aseptic catgut sterilized by dry heat is a good culture medium for bacteria, and it takes a clean surgeon to handle it successfully. Therefore, it is the problem of the future to impregnate catgut with a non-irritating antiseptic which will remain with it until the last fiber is absorbed; when this is attained, then, and only then can we speak of ideal catgut.

DISCUSSION.

Dr. JOHN E. OWENS of Chicago—A few years ago I was purchasing my catgut from a certain place. Two patients were sent to me by a physician from the same town. I operated upon one patient, making an amputation of the breast. Intense septicemia rapidly set in and the patient died. She was considered a strong healthy woman otherwise. The same day I operated on the other patient, the operation consisting in opening the abdominal cavity to clear up the diagnosis. I found malignant disease of the liver at the hilum, which was in such relation to the vessels that an operation was deemed impracticable. I simply made a short incision, introduced the fingers and was able to get all the information desired. The patient was a debilitated, nervous man, and in three days he was dead. I was horrified at the death of these two patients. I went home and burned all my clothes, I did not know really what to do. I thought of some defect in the preparation of the instruments. The operations were performed in a hospital in which I never before operated. Then I studied and tried to work out the problem. I had some urine examined and found it was loaded with anthrax bacilli, and then I had the catgut which I had used in both cases examined, cultures made from it and anthrax bacilli were found. This leads me to say that the use of commercial catgut ought never to be thought of unless we know exactly how it is prepared. We immediately procured the apparatus of Dr. Boeckmann for use at St. Luke's Hospital, and we have since been using catgut prepared after his method. I have also been using it in private practice as prepared by him. We do not use catgut until we finally secure the degree of heat. But we had considerable difficulty in obtaining this heat owing largely to the gas stove that was used. The plate at the bottom of the catgut sterilizer was too small, and enough heat could not be utilized for the purpose, and instead of one row of jets we substituted another one, or two or three, and in that way we had no difficulty in getting a temperature of 200 degrees, but I have never touched commercial catgut since.

Dr. ARTHUR D. BEVAN of Chicago—I believe catgut can be sterilized thoroughly by a number of different methods. This, however, does not carry with it primary wound-healing if catgut is used, because undoubtedly it does contain at times, if not always, certain irritating and toxic substances which will so irritate the tissues as to produce suppuration and because a pathogenic germ is the essential factor, and it will produce

conditions which in a given case are sufficiently weighty to produce suppuration, because no surgical operation is absolutely aseptic. We must regard all surgical wounds as those in which bacteria are present that are capable of producing suppuration. I mean all wounds in which the skin is involved, or in which any of the hollow viscera are implicated. If we accept this no wound is absolutely aseptic, and following out this line of reasoning we must conclude that many wounds heal in an aseptic way, what we call normal wound-healing without any reaction and without any appearance of pus. In those cases we must suppose that the few germs present are not sufficient to infect the wound and the tissues are well taken care of. If in a case we add to the tissues an irritating substance, it requires a certain effort on the part of the tissues to remove it, and we very frequently add sufficient factors to bring about a suppuration which otherwise would not occur. I have watched this very carefully in some of my cases, and I am positive that we have many cases of infection from catgut in which the catgut is sterile. I have demonstrated this by making repeated cultures in catgut prepared in a number of ways, by boiling in alcohol, by the old method of ether and alcohol and bichlorid, by the catgut prepared by dry heat, and the catgut prepared by boiling after it had been hardened in formalin. If we accept the statements which I have made, or if this can be demonstrated it brings up the subject of the best method of surgical sterilization in a very much broader way, so that we must discuss all of the factors which prevent primary wound-healing, if we accept the fact that no wound is sterile, that the factors which produce suppuration are many times clinical, not necessarily the germs themselves, because we always have them present, but other added factors. I have followed out this line of reasoning in a systematic manner during the last year or two, and I believe the study of other factors besides the elimination of the germs is very important. Those factors are very many and will be noticed in our clinical work as, for instance, tension. You will approximate the wound with tension; your wound and your dressings are sterile; you have tension present; tension produces necrosis; you invariably have some germs deep in the skin and the tension is the cause of failure of primary union. In the same way we may consider pressure. I have had several cases in which the wound was absolutely sterile, yet pressure applied by a very hard dressing over the stump of an amputated leg will produce necrosis. We always have germs present later and infect the wound. In the same way we find that the presence of dead and mutilated tissue is an important factor. A wound in which we have clean incisions, no tearing, will unite much more readily than one in which we have tearing and gross tissue. The elimination of blood clots is an important factor.

Another point is the general condition of the individual himself. The subject is well illustrated by a case which has been in my hands recently. I operated for hernia in a diabetic patient. There had been at no time marked suppuration. The wound healed primarily, following which there was a little fluctuation two weeks after over the line of wound healing. I found apparently sterile fluid containing some leucocytes and later slight suppuration. Undoubtedly the general condition of the patient had much to do with this.

Another point is infection from the intestinal tract. Intestinal toxemia undoubtedly does occur quite frequently. How else can we explain such a case as this, for instance, primary healing of the wound of a shoulder joint amputation, the entire wound apparently sterile, and yet within ten days there was slight bogginess over the wound, it is opened and some suppuration is observed? The details in this case were failure on part of the nurse and interne to carry them out. The patient being rather ignorant was allowed to go a week without evacuation of the bowels. In examining the pus the bacillus coli communis was found. This case seemed to be a clear one of infection of the wound from absorption of the intestinal contents. I must apologize for introducing this feature of surgical work, but still it impresses me as being very important, because many surgeons place the entire responsibility of surgical operations in primary wound-healing upon the aseptic treatment. There are many other factors that are as important almost as the reduction of infection to a minimum, which is certainly all we can ever accomplish in the field of operation.

Dr. R. HARVEY REED of Columbus, Ohio—In the infection of wounds I have noticed that the infection only extends to the integument and down to the deep fascia. For instance, in the use of silk-worm gut, used for the purpose of suturing the abdominal wall, the interrupted sutures going from the integument through into the abdominal cavity, and then out again on the other side, and yet I have noticed when the silk-worm gut was sterilized completely we would have, after a few days or a week perhaps, a stitch abscess. I have observed in those cases that the muscles and peritoneum were completely united, there being no trouble whatever, notwithstanding the suture had gone through all of these layers. If you take out the suture you will simply find infection extending down to the deep fascia and no farther. Now, it occurrs to me that this does not come from pressure nor from infection due to the suture material which was used, whether it be silk, silk-worm gut, catgut, or whatever it may be. If the infection was due to the suture it should have extended to the peritoneum, and especially so if you have passed the same suture clear through into the peritoneum, and taken it up and out on the other side. It is possible to have infection, no matter how careful we are with our dressings after introducing the sutures. After applying what we believe to be aseptic dressings, in some way the infection will enter at the surface and extend downward to the deep fascia. I have tried to avoid this by using buried sutures and sterilized catgut, sterilized kangaroo tendon and sterilized silk worm gut, but I have had the same results in many instances wherever I had the suture coming to the surface, so that more recently, after using sterilized material, I have dressed the wound with an antiseptic dressing so as to prevent the entrance of germs from the surface, following up the suture and producing an infective center. Since I have adopted this plan, about a year ago, I have used silk-worm gut—have not used catgut—and have employed silk, and have practically gotten rid of stitch abscesses. Whether this is because of better sterilization of the suture material, or because I put on antiseptic dressings, which usually consist of gauze dipped in equal parts of alcohol and water and 1 to 2000 bichlorid laid on the wound, I am unable to say.

In the hospital it is conceded by the staff that Dr. Boeckmann's gives better satisfaction than any other sterilizer that we have used.

I have been using the last year pyoktanin catgut. By using pyoktanin it colors the catgut blue, and if the catgut is not entirely saturated and is white in the center, then it is not thoroughly sterilized. I have had good results from it.

One objection I have to chromicized catgut is that it is like a piece of wire, not easily handled, while the other suture material prepared by pyoktanin is soft and pliable, and I believe is better sterilized and becomes absorbed with less difficulty than chromicized catgut. I have found chromicized catgut remaining unabsorbed two months after operation, which is a thing we do not desire.

Dr. J. P. LORD of Omaha—I have noticed, where there has been suppuration following the use of silk-worm gut or silk sutures, that where the wound is closed *en masse*, too much is expected of a single suture. Many operators put in their stitches half an inch apart in a wound of considerable size, and expect altogether too much of these sutures. When inserted in this manner, they include a great deal of tissue and are necessarily tied very tightly, and I believe this to be one of the most fruitful causes of suppuration. I made this observation in watching Dr. Joseph Price this summer. He closed all his abdominal wounds in this manner, but the stitches were one-quarter of an inch from the margin, and not more than one-quarter of an inch apart. This made more thorough apposition than the same method observed by me in other hands. We should not expect too much of any one suture, and great care should be taken to make the tension uniform.

Dr. L. E. LEMEN of Denver—One reason why we have pus when we insert our stitches through the entire abdominal wall and include so much tissue in the stitch, is dependent upon pressure necrosis. With stitches put in after a clean incision, although we may not have any pus, and tied moderately tight, we have more or less engorgement or thickening of the tissues that produces necrosis, and we would not have this condition if we did not include so much tissue in our stitch. I have attributed pus in my cases to that.

Dr. W. J. GALBRAITH of Omaha—I do not believe it is possible for us to use any preparation of suture material without evil results, unless we consider the mechanical features in its application. All wounds, no matter how carefully and thoroughly we carry out our asepsis and antisepsis, contain more or less infective material. If a suture is applied too tightly, it causes strangulation, which is followed by inflammation and destruction of tissue, thus preparing a bed for the propagation of existing bacteria to develop to a greater or less degree. I believe more serious results are produced by the improper insertion of sutures than by the knife of the surgeon.

As regards the various suture materials used, with few exceptions, I rely entirely upon catgut. I believe it can be used to better advantage, and that we can secure better results with it than by any other one ligature, or all of the others combined. In the last month I saw one of our most noted surgeons in the country perform an operation, first using a reten-

tive suture of silk-worm gut, then a continuous suture for the purpose of securing and maintaining apposition of the skin, and at least one hundred stitches were used. I consider this radically wrong, unmechanical and unjustifiable.

Dr. W. W. GRANT of Denver—If I understood Dr. Boeckmann correctly, he made the statement that the only way to sterilize catgut was with dry heat. All surgeons do not prepare it in this way, and I have had so little confidence that my catgut has been thoroughly sterilized that I have confined myself to the use of chromicized catgut as prepared by Mr. Lister. I get it from London, and place it in a 5 per cent. carbolic solution shortly before using it.

Dr. N. SENN of Chicago—Since we have prepared our catgut according to the formula of Hofmeister, somewhat modified, we have done away with the evil results and have noticed no stitch abscesses. We regard catgut as absolutely reliable and aseptic, as has been proven by extensive practice in a number of hospitals throughout the United States.

Hofmeister, who has done such excellent service in perfecting the formalin preparation of catgut, gives the following most recent method: 1, the catgut is wound on a glass plate with slightly projecting edges, so that the gut is free from the sides of the plate and exposed to the circulation of the boiling and flowing water; the ends of the gut are fastened through holes in the plate; 2, immersion twelve to forty-eight hours in aqueous solution of formalin 2 to 4 per cent.; 3, immersion in flowing water at least twelve hours to free the gut from the formalin; 4, boiling in water from ten to thirty minutes. Ten to twelves minutes is amply sufficient, as all microbes and spores are killed by exposure to boiling heat for that length of time; 5, hardening and preservation in absolute alcohol containing 5 per cent. of glycerin and one-tenth per cent. corrosive sublimate.

The first attempts to sterilize catgut by this method under my own direction were made at the St. Joseph's Hospital by the Sister in charge of the operating room. The result of experience has led us to modify the procedure in several ways. Instead of glass plates ordinary abdominal glass drainage tubes have been employed, upon which the gut is wound quite tightly. These glass drains have been found an excellent substitute for the plates. An ordinary large test tube will answer the same purpose. The remaining directions given by Hofmeister were followed to the letter. Numerous inoculations with fragments of catgut prepared by this method in sterile gelatin invariably gave negative results. The catgut is as strong as the raw material, hard, and the knot is less liable to slip than when the ordinary material is used. We have also ascertained that the formalin catgut can be reboiled almost any number of times without impairing its strength.

Catgut to be safe should not only be absolutely sterile but should contain a sufficient quantity of efficient antiseptic to render it unfit as a culture medium for pathogenic microbes. Hofmeister renders it antiseptic by immersing it in an alcoholic solution of corrosive sublimate. Others have substituted carbolic acid for sublimate. Both of these antiseptics unduly irritate the tissues and increase the primary wound secretion, effects which can not fail in interfering, to a certain extent, with an ideal healing of a wound by primary intention. The valuable and interesting experiments made recently by Lauenstein leave no doubt that it is almost next to impossible to render the field of operation absolutely aseptic by any of our present methods of disinfection. We are forced to admit that nearly every wound inflicted by the surgeon's knife contains some pathogenic microbes, notwithstanding that the strictest aseptic precautions may have been carried out. The experiments made by Ewald have also furnished positive proof that sterile catgut contains a sufficient quantity of an unknown toxic substance which, by its destructive action upon the cells engaged in the reparative process, transforms them into pus corpuscles, resulting in the production of a limited aseptic suppuration and the formation of sterile pus. Undoubtedly many of the stitch abscesses which occur in the practice of painstaking aseptic surgeons have such an origin. These experimental researches force upon us the conclusion that catgut should not only be sterilized, but that it must be made sufficiently antiseptic to at least inhibit the growth, if not destroy the pyogenic microbes which enter the wound during the operation, or which may reach it later through the circulation. In this part of the preparation of catgut I have modified Hofmeister's method by substituting, for the corrosive sublimate, iodoform. After boiling the deformalized catgut for twelve to fifteen minutes, it is cut into pieces of desirable length, tied into small bundles, containing from six to twelve threads, when it is immersed and kept ready for use in the following mixture: Absolute alcohol, 950, glycerin 50, iodoform (finely pulverized) 100 parts. The alcohol dissolves part of the iodoform. The bottle containing the catgut should be closed with a well fitting glass form, and should be shaken well every few days to bring the dissolved iodoform in contact with the threads. The catgut can be kept in this mixture any length of time without losing its strength. One of the valuable properties of iodoform applied to a recent wound is to diminish the amount of primary wound secretion. It does not destroy pus microbes but inhibits their growth. I have used catgut prepared by these modifications of Hofmeister's method with the most satisfactory results, and shall continue to use it until some better method is devised. (For a more detailed account of the method of catgut sterilization, see JOURNAL AMERICAN MEDICAL ASSOCIATION, Dec. 12, 1896, p. 1219.)

Dr. LEMEN—Have you had any difficulty with the iodoform decomposing and in having free iodin?

Dr. SENN—No. Until recently we used a 10 per cent. emulsion. Now we have made it a little weaker because the Sister claimed that it impaired somewhat the strength of the catgut. But we have used catgut for six months immersed in a 10 per cent. emulsion without losing any of its material strength. I have my reasons for modifying Hofmeister's formula, because I do not believe that the use of aseptic catgut will furnish us the ideal material. I desire to have absorable material that is not only aseptic but antiseptic for the purpose of eliminating both the microbes and the toxins of the microbes, and I believe it is this addition to the preparation that renders the catgut far more reliable. It is the iodoform that keeps the wound dry, that furnishes one of the conditions favorable to ideal wound-healing—a dry wound, at the same time, it is an active agent in counterbalancing the ill local effects of preformed toxins.

Dr. BOECKMANN—I did not say that catgut could not be sterilized in any other way than by dry heat. I did say, however, that we know almost to a mathematical certainty the effect of dry heat, and that if catgut is properly sterilized according to the rules laid down by bacteriologists, it is thoroughly sterilized. I have seen in reports from Germany and other countries that they have found bacteria in every kind of catgut that has been prepared in a chemical way, as well as by dry heat.

I am convinced that Dr. Senn prepares his catgut in the right way; that it is sterilized, not by boiling, but in formalin, which is one of the strongest germicidal agents we have.

TRAUMATISMS OF THE CONTENTS OF THE ABDOMINAL CAVITY.

Presented in the Fourth Annual Meeting of the American Academy of Railway Surgeons, held at Chicago, Oct. 6-8, 1897.

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When we turn our mental skiascope in retrospect, so as to reveal the dark places or shadows in the history of surgery, we are surprised to find that little more than a decade has passed since stab and gunshot wounds of the abdominal contents have been treated intelligently from a surgical standpoint. In these cases there was a wound of entrance and perhaps a wound of exit also, with perchance other and undisputable evidence of penetration of the organs within. Yet, notwithstanding these indications for operative interference, surgeons had continued for many years to ask the question so strikingly put by Abernethy, who asked, "is it enough that we examine the little hole made by the bullet, and as Nature, who shakes her head and leaves the patient to his hopeless fate?"

With the development of abdominal surgery, after the introduction of antiseptics, came the solution of the question. When, at the present day an advocate of any course other than that so generally adopted could not gain a respectful hearing. Slow as the profession has been to adopt radical surgical measures in the class of cases referred to, slower still have we been to adopt this course, in rupture from contusion, because of the absence of the same well defined evidence of visceral injury. These latter cases, which

are more in the province of the railroad surgeon, especially commend themselves for our consideration and discussion, because there can be no condition affording such amplitude of uncertainty as these. With the accumulation of cases and records of clinical observations we find our symptomatology uncertain. Hence the wisest acumen and profoundest judgment are required to guide the surgeon in his course, in the treatment of these frequently obscure, always grave and perplexing cases.

"Trumatisms of the contents of the abdominal cavity" is so large a subject that the symptoms, diagnosis and operative technique can receive but brief consideration, so that it shall be my province to discuss briefly the indications, contra-indications or limitations of operative interference and treatment in cases of subparietal contusion, rupture or laceration of the contents of the abdominal cavity, rather than try to cover the very large field indicated by the title of this paper.

The recent text-books on surgery, works on abdominal surgery, journal articles and the opinions and practices of operative surgeons may be said to be unanimous in recommending radical surgical procedures, which can not but be regarded as the most judicious conservatism.

The stomach may receive varying degrees of injury from the receipt of kicks, blows, falls, squeezes, etc. Contusions may be received which may amount to only a temporary soreness, aside from the transitory shock invariably experienced to a greater or less degree, but usually this symptom is more marked when the stomach receives the injury than that produced by the receipt of a like amount by any other abdominal organ. This symptom may be so variable, however, as to be a poor index to the amount of damage actually sustained. A severe contusion, therefore, should be treated with the greatest circumspection; the patient should be compelled to remain in the recumbent position and all food or fluid by the mouth withheld, for the purpose of putting the injured organs at perfect rest, to permit of early resolution and repair, and as a precaution against secondary perforation in case of gangrene of the stomach walls, and also to mitigate the evils of rupture if it be actually present.

These cases are always of sufficient import to require the co-operation of the consultant. The general practitioner, especially, should forearm himself by calling the surgeon to his aid, just as he should do in case of appendicitis, so that the moment the emergency arises an operation can be done without the usual delay so fatal to an unnecessarily large portion of abdominal injury cases of all kinds.

The writer takes a strong stand for operative interference just so soon as symptoms point to probable rupture, barring shock bordering on collapse. Patients in a state of collapse should be rallied from this condition if possible, with a view of a more favorable opportunity to intercept, if possible, inevitable fatality. For, unrepaired ruptures of any considerable degree, of either stomach or bowel are probably always fatal. The prognosis, therefore, of this class of abdominal cases is worse than that of other forms of injury to the hollow viscera. It exceeds in mortality that produced by gunshot missiles of the largest caliber.

To enable us to cope more successfully with these desperate conditions, we should be better equipped for treating shock and limiting its influence to a minimum. The hot water table, mattress or pad heated by an electric current is not enough. The extremities should be enveloped by some super-heated appliance to raise the body temperature; at all events, an efficient means should be made immediately available, to eliminate this fault, the need of which is almost universal.

With the more extended use of intra-venous saline injection, a distinct advance has been made in the successful handling of desperate cases, counteracting to a considerable degree the effects of hemorrhage, mitigating the severity of shock, reinvigorating the vital functions and contributing to the vital resistance. When we have added to these means a better knowledge of shock and improved methods of its treatment, we may limit the disastrous effects. This accomplished, earlier operations better borne, will lessen deaths from the second factor, septic peritonitis. Clean, judicious work in patients able to withstand the added shock, does not in itself decrease the patient's prospects. Closure of rents in the stomach or bowels by the most expeditious methods is imperative. Rather bring the wounded viscus outside the abdomen when practicable, or pack and drain, than to violate this injunction to provide against extravasation of visceral fluids. The stomach contents not being so septic as bowel excreta, rather more chances may be taken with the last named methods in dealing with the stomach than the bowel. Then, too, in the former it may be practicable to evacuate and cleanse, thereby lessening the danger in the use of this method. Though many bowel ruptures can be quite readily treated by leaving them outside the abdomen, when the same treatment of some wounds of the stomach may be quite impossible. If life is temporarily spared, much may still remain to be accomplished before the patient is made well. It must be remembered that nutrition is disastrously affected when the upper bowel empties outside the abdomen.

After rupture of the liver, gall bladder or bile ducts from contusion, there is not the same urgency for operative interference, unless it be for the arrest of hemorrhage, in which case the ligature, cautery and gauze tamponnage must be our reliance, to be used as required. Operative interference, however, after severe contusion about the liver, with symptoms to justify, should not long be delayed, for even though not septic the bile may be capable of much mischief. Suture of the gall bladder is indicated where practicable, which should be fortified by drainage. Gauze will answer in simple cases, but drainage by the gauze covered tube, together with judicious gauze packing, should meet the indications, and is probably all that is practicable to do where the cystic or common ducts are involved.

As to the diagnosis of rupture, Bryant says, after recently quoting five cases: "It must be confessed there are no special symptoms which can be accepted as indicative of its existence, although severe shock and collapse as immediate result of a forcible injury to the right side of the thorax should always suggest its probable existence, and even when the same kind of injury to the same region is unattended by any such serious symptoms the surgeon should be alive to the possibility of a limited rupture of the liver being present, and treat the same accordingly."

The spleen is especially vulnerable to injury, because of its friable nature and its bleeding quali-

ties. The organ should be saved if possible, but in case of necessity it may be partially or wholly removed, with less danger to the economy than under any other circumstances.

The pancreas may sustain sufficient injury to require ligation of its vessels, or its substance, together with partial removal. Gauze tamponnage may be sufficient in rupture of moderate extent.

Rupture of the mesenteric or omental vessels, causing free hemorrhage, can be treated intelligently in one way only—by celiotomy. After removing the blood from the abdomen, a forceps armed with gauze, introduced deep into the flanks and the pelvis, is likely to indicate the bleeding locality. The ligature is the remedy, but gauze may be required as a makeshift. Any considerable tear of the mesentry, parallel with the gut, necessitates resection of the latter, in the performance of which the shortest and best methods should be adopted. Intestine of questionable vitality should be left outside the abdomen if resection, for any reason, is contra-indicated. Exception may be made to this rule when the area of injury is small and in a loop of intestine near the abdominal incision, when gauze can be so placed as to isolate the questionable point and effect drainage in case of subsequent leakage.

Ruptured kidney requires exploration by abdominal or lumbar incision, for control of extensive hemorrhage, which is indicated by marked collapse and swelling. Excision should only be performed when the hemorrhage is uncontrollable and the presence of a second kidney is ascertained. Even moderate hemorrhage may demand nephrotomy for hydronephrosis and to clear the pelvis or ureter from an obstructing blood clot. Extensive laceration of the kidney may heal kindly; it being very vascular, repair takes place quickly. Gauze packing and drainage suffice in the majority of cases. Cystotomy is likely to be necessitated for the removal of blood clots from the bladder. In this the median perineal operation has the preference. Independent of other conditions, unilateral kidney injury has a favorable prognosis. Mr. Harrison says that "laceration of the kidney is a lesion more commonly recovered from than any corresponding one of an internal organ."

Absolute rest in bed, local application of cold, internal administration of opium and astringents—chief among them ergot—are the means to be employed in checking hemorrhage. The immediate repair of the ureter is indicated, but the diagnosis of torn or ruptured ureter can not usually be made until sufficient time has elapsed to produce the extravasation tumor; at which time the altered tissues prevent ideal treatment, when we must be content with tentative measures. Incision and drainage through the loin would seem to be the most practicable. Repeated punctures have been successful but not always. Secondary complications may require such surgical treatment as may be necessitated by the varying conditions. The surgery of traumatisms of the ureter has not been extensive. Sufficient data is therefore lacking from which lines of treatment may be established, but I have confidence that our highly perfected art will soon have greater achievements to its credit in this as in all other lines of surgical adventure. The bladder, ruptured through the peritoneal portion, requires repair as soon as a diagnosis is made, for peritonitis and uremia are imminent dangers, ensuing in twelve or twenty-four hours. The diagnosis should present no difficulty. The Trendelenburg position much facilitates the operation of repair. Lembert sutures or a modification thereof answers well the purpose, though the purse-string suture of Tait is probably quickest and best if the rent is not too great. Drainage is the rule and is a wise precaution. Frequent catheterization for several days should not be neglected The peritoneum should be dried with gauze. Saline transfusion should be the rule, to favor the elimination of urea absorbed by the peritoneum. Summers of Omaha reports the speedy onset of uremia, after leaving a quantity of salt solution in the peritoneal cavity, in a case otherwise favorable for recovery. It was thought that the sudden large dose, following the rapid absorption from the peritoneum, overwhelmed the kidneys. Leaving salt solution in the peritoneal cavity would, therefore, seem to be a contra-indication in these cases.

The surgery of the thoracic duct may be said to be still in its infancy. Little more than tentative measures have as yet been accomplished.

Rigidity of the abdominal muscles, with marked restlessness and pallor, though variable in degree, are strong diagnostic indications of visceral rupture, more especially so of the stomach and liver. Constipation, though usually present in bowel rupture, is not to be relied on, and is practically worthless as a symptom in these days when a diagnosis must be arrived at in a few hours, rather than in a few days.

Operative interference is contra-indicated in traumatisms of the abdominal cavity, in severe shock, unless to contral hemorrhage. Never operate when the patient is in a condition of collapse or cyanotic from peritonitis and heart failure. General peritonitis from bowel rupture is nearly always fatal, but a few recoveries after operation have peen reported.

The sooner rupture of the alimentary canal or urinary bladder is operated upon the better. The proportion of recoveries decrease rapidly after six and are usually hopeless after twenty-four hours. Indeed, most of the cases succumb in from twelve to forty-eight hours. The surgeon should have his inspiration before he gets his case, for there is no time for vascillating afterward. He should be prepared for action.

The railroad surgeon is in the service of two masters, which position always calls for the greatest circumspection, and especially is this true of our relation to railroad cases. But when we remind ourselves that in serving the best interests of our patients we are also doing the highest and best service for the railroad our course is plain.

Unnecessary and hopeless risks should not be taken in unwise zeal to render service. But humanity and duty require first consideration to our patients, an implied obligation required and expected by our employers.

DISCUSSION.

Dr. T. J. REDLINGS of Marinette, Wis.—I feel that I have been too conservative in the treatment of this class of cases and believe that Dr. Lord has outlined the proper limitation of precautions.

Dr. R. HARVEY REED of Columbus, Ohio—Dr. Lord has pointed out many conditions of the abdominal cavity arising from traumatism that baffle the railroad or any other surgeon to diagnosticate until the case has reached a serious condition. I recall a case in which a party was struck with a lath on the abdominal wall without even lacerating the skin, simply making a little red mark. The man was a large, muscular individual. He walked to his home, some four or five blocks, after the accident, and feeling badly he sat around the house for a short period, then went to bed and by and by what was termed

peritonitis set in. On examination I found a rupture of the intestine just as if the corner of the lath had struck it, tearing a triangular hole. This was done without laceration of the skin, fat or muscular tissues of the abdominal wall. I have seen two or three cases very much like this, but this was the most marked of the three in which there was no laceration of the abdominal wall, and yet there was severe injury of the intestinal tract. I advised operation at once, but some of the attending counsel thought it was unnecessary; that the condition was simply due to a bruise, and that the operation would not be of any advantage. After a little while the patient became worse and an operation was insisted on. On operating, we found the condition I have already described. Now, suppose it had been a railroad case and the railroad surgeon had been called in, the legal point would have been of great importance to the railroad, yet very excellent counsel had charge of the case and were unable to satisfy themselves that there was a tear of the small intestine, and it was surprising to find that the bowel, which is so movable and easily pushed from one point to another, should be torn by this force from the outside, without tearing the abdominal muscles. I can not account for it, but I know it to be a fact, and the patient died from peritonitis, extravasation and septic infection.

What are we to do under such circumstances? I think with the advantages of aseptic and antiseptic surgery, that where we have a doubt in our minds as to traumatism we are justified in making an exploratory incision to determine what is the matter at an early stage and not wait until the condition is such that we are unable to meet the complications that have arisen.

Dr. W. W. Grant of Denver—What were the symptoms or evidences that called for an exploratory incision?

Dr. Reed—In this particular case there was not the extreme shock that we would expect, but there was constipation. There was no action from the bowels from the time of the injury until I saw the man three days later. Where we have constipation following an injury of that kind, supposed to injure the bowels in a patient who is physically well otherwise and has been having action from the bowels every day, it is one of the points we should seriously consider. A little later we had a slightly increased temperature, followed again by a temperature a little below normal, but neither one sufficiently high or low to attract attention from the temperature standpoint. But I am always suspicious if I find a high temperature in a healthy man dropping a little below normal after an abdominal injury. Furthermore, we had in this case the physical fact that the man had been struck a terrible blow. He was an unsually strong man with great physical resistance which enabled him to walk three or four blocks to his home after sustaining the accident, and then there followed a condition which necessitated his going to bed. There was pain, lassitude and general depression. It seems to me these symptoms, following inside of twenty four hours after the accident, were sufficient to warrant a surgeon in making an exploratory incision, when there was nothing else to account for the condition; he was perfectly well when the accident happened.

I recall another case in which a person was shot five times in succession through the abdomen, every bullet passing through with the exception of one which was taken out of the skin of the back. That man did not have any particular shock. He, like the other patient, walked four blocks to his house, laid around for three or four days without any particular change in temperature and had no particular pain, and in a few days he was well and working again. Here was a case that I am unable to say what happened in the abdominal cavity, but evidently these bullets passed through without perforating the intestine. On the other hand, we had no perforation of the abdominal parietes, but we had the symptoms which would indicate that there was a serious injury to the abdominal tract.

Dr. W. J. Mayo of Rochester, Minn.—In order to widen the scope of the discussion, I wish to speak of those cases first seen more remotely from the time of injury, and particularly of those in which free fluid is present in the abdominal cavity. I recall the case of a boy, who was run over by a wagon and injured in the region of the liver. After a couple of weeks I found the boy was only moderately sick, with a temperature of 102 degrees, but he had a well marked ascites. The abdomen was drained of a large quantity of bile. The boy fully recovered.

The second case was that of a man of 40, brought into the hospital four days after receiving a severe contusion of the abdomen. He was obstinately constipated, had a temperature of 102.6 degrees, but a good pulse and looked well. After considerable effort his bowels were acted upon. About the sixth day ascites began to develop, although the general condition steadily improved. The free fluid slowly disappeared and in the course of six weeks he fully recovered. Just what the cause of the fluid was in this case can only be surmised. I was careful to keep him very quiet and put him on a liquid diet during the second week, when, as experience has shown, a contused intestine is so liable to undergo secondary perforation.

The third case was one of rupture of the bladder from great violence, and in which urine was present in the abdominal cavity many hours before drainage was instituted. There was no peritonitis. The man died, however, a week later from the effects of a crushed pelvis received at the same time.

In these three cases the tolerance which the peritoneum may occasionally exhibit toward injury was well marked.

Dr. Fred J. Hodges of Anderson, Ind.—I presume that it will be taken for granted that every logical-minded physician would inquire carefully into the previous condition of the patient, but when one is called to a man, and a history of the injury is obtained, it is not infrequent that one's attention is so firmly riveted upon it that he neglects going into the previous history of the patient. A recent case coming under my observation illustrates the necessity, however, of considering it from all sides. A man who was working on one of the construction trains, and had worked for at least a month before I was called to see him, had struck the handle of his shovel against the belly along toward quitting time on Saturday and felt very little inconvenience from it, except that the belly was a little sore. That night he was awakened about 10 o'clock by an excruciating pain. A local physician was called in and found him practically pulseless and suffering intense pain. I saw him at 4 o'clock in the afternoon. There were indications of peritonitis, with the man in a condition which forbade operation. The same evening he died. On the following day an autopsy was made, and a well marked appendicitis was found, with practically the entire appendix gangrenous. By inquiring into the history the night before, it was learned that the man had been having some intestinal disturbances for a week and a little elevation of temperature at night. Yet he worked through the course of the disease and up to within twenty four hours before his death from peritonitis. So that a case like this occurring in a man's practice will cause him to look more carefully into the previous history of all cases of injury than he might otherwise do.

There was one point in the paper with which I take issue, and that is regarding the method of ridding the bladder of clots. In a man of middle age or under, as the average railroad employe would be, I believe that the high operation, or high drainage of the bladder, to be preferable to perineal section, that it can be quickly made, the bladder easily emptied, and there is no subsequent danger of stricture, as in the lower operation.

Dr. W. A. Ward of Conneaut, Ohio—In connection with the point of obscurity in diagnosis, especially unattended with any outward signs, I was called to see a man who was kicked in the abdomen by a horse. Following the injury there immediately developed severe pain. This case came under my notice in pre-antiseptic days, and of course, an exploratory incision was not made. The man was immediately put to bed, although there were no severe symptoms aside from pain, for three or four days. The most careful examination failed to disclose any marks on the exterior; but the man died about the seventh or eighth day with symptoms of well marked general peritonitis.

Dr. W. W. Grant of Denver—How to treat these cases after the diagnosis has been made is the important question. In cases of laceration with extravasation, to open the abdomen and close the rent is the proper thing to do as soon as possible, or after reaction is established. But the difficulty is to know when we have a laceration as distinguished from profound shock, due to blows upon the abdomen through their influence on the solar plexus. We have all seen cases in which shock has been profound without laceration. Our axiom in surgery today is that no one should operate if shock was profound. After reaction is established, then the surgeon should determine in a few hours, if possible, whether or not there is laceration of any of the hollow viscera, or whether there is hemorrhage or not. These are questions it is often extremely difficult to determine. In case of hemorrhage we do not now wait so long before tying the bleeding vessel and closing the abdomen, because hemorrhage will prove fatal if this is not done. If we open the abdomen, although the prognosis is grave, we may save a patient that would otherwise die. If we can arrive at some of the symptoms indicative of the condition, it is the important point in this matter. In case of extravasation of urine we will have septicemia very soon if we do not open the abdomen and close the rent. If the intestine is lacerated and the colon bacillus has found its way into the general peritoneal cavity, we are quite certain to have general septic peritonitis and death, and early operation is the only thing to do, and the patient loses nothing by running that risk. If, after reaction, we have evi-

dences of localized peritonitis or a subnormal temperature, indicating a recurrence of hemorrhage or a continuance of it, the abdomen should be opened and the rent found, if possible, and repaired. With the opening of the abdomen we have a means of flushing the cavity with hot water and saline infusion, which at first were not thought to prove beneficial in bringing about reaction in many of these cases.

Dr. JOHN E. OWENS of Chicago—We ought to bear in mind that excision of the kidney is not always necessary in cases of traumatism, because we can remove a portion of it and get good results. This is an absolute necessity where we have no reason to suppose that the other kidney is diseased. In some cases an exploratory incision for the purpose of examining and handling the other kidney, when it can be done, is justifiable practice. I have done this a number of times where I have had to operate on pathologic kidneys, when I was in doubt as to the nature of the other kidney, and when the question of removal of the damaged kidney came up.

In some cases I have been impelled to open the abdomen when I did not seem to be guided by the assemblage of symptoms, except rigidity of the abdominal walls. This is a constant symptom of perforations of the intestine and in injuries to the other abdominal contents.

There is another matter we should keep before us in considering the differential diagnosis, namely, rupture of the diaphragm. We should ever be on the alert, even when a case has gone along well, or indifferently well for several weeks, and I can save time by giving you a synoptical report of a case. I forget the manner in which the patient was injured, but he had general uneasiness, which subsided in a measure, so that the patient was comfortable most of the time, as a result of the ordinary methods pursued—rest, opiates and hot applications. In the course of two weeks or more (I am speaking now with approximate correctness from memory) he had a very severe pain in the stomach and bowels, confined to the upper half of the cavity. We thought he would die in a short time, but opiates and hot applications brought him around, so that the next morning he was pretty well again. This occurred after eating several articles of food that his friends brought to him. He was doing so well that he was allowed to get up on a wheel chair, and one night subsequently he had this intense pain again. We prescribed the same treatment, but he died within seventy-two hours. This man had also a fracture of the ribs; he had emphysema and pneumothorax. A postmortem examination was made and we found the whole stomach and a coil of intestine that was gangrenous in the pleural cavity. The stomach was considerably dilated, and all this had passed through a hole in the diaphragm through which I could barely introduce the ends of three fingers.

Dr. H. REINEKING of Sheboygan, Wis.—One important condition which is apt to follow these injuries as a remote effect, is a localized adhesive peritonitis and the gradual development of intestinal obstruction. I have seen two cases within the last year which illustrate this danger very well. The great danger in these cases lies in slow development. Constipation comes on so gradually that operation is deferred until too late, until there is amputation of the afferent portion of intestine and perforation. When these symptoms develop, perhaps months after the injury is sustained, they call for an early exploratory laparotomy.

Dr. C. K. COLE of Helena, Mont.—The case mentioned by Dr. Reed illustrates the fact that there is a very wide difference with reference to symptoms in cases of injury to the abdominal viscera, and would seem to indicate that there are cases where operative interference is not necessary, or at least the condition can not be appreciated so that one would be warranted in operating. While in the other, and I believe in most of the cases of perforations of the walls of the abdomen, we are warranted in making an exploratory operation. Dr. Lord mentioned, in connection with the treatment, the use of opium and referred to the fact that Dr. Summers of Omaha left a saline solution in the abdominal cavity. As a rule, we should not make use of opium in these cases. I believe that we should leave the abdomen as dry as possible after a laparotomy for any lesion.

Dr. W. J. GALBRAITH of Omaha—Two or three important symptoms have been overlooked in injuries of the liver.

As regards Dr. Lord's quotation from Professor Bryant of New York, in which he says that delirium and shock are invariably two of the principal symptoms, I beg to take issue with him, for in at least five or six cases that I recall to mind, with one exception where there was the complication of ruptured spleen, evidence of shock was not manifested in the least.

I remember the case of a brakeman who fell from the top of a train, striking on the broad bars on his right side, and during the examination he said that it "knocked the wind out of him," but that otherwise he was all right and wanted to go home. Experience in this case prompted me to strongly insist upon the man remaining in the hospital, for he presented that peculiar pallor and uneasiness which we may regard as one of the objective symptoms of rupture of the liver. After receiving the injury he walked six or seven blocks to the hospital without any aid, and in company with one of his friends, who had telephoned me that they would like me to see the man and make a report. He was put to bed and kept quiet. On the following day there was a slight rise in temperature with increased uneasiness and that peculiar pallor which is indicative of shock, but without the other symptoms. At the end of four or five days there was slight tympanites, increased uneasiness bordering on delirium, and about the sixth or seventh day he died. Autopsy revealed a very extensive laceration of the left lobe of the liver.

Another case was that of a lady, 22 years of age, who was in a railroad wreck about a year ago. She received injuries without any apparent external evidences. I saw her three or four hours after the accident. She was sitting in a chair and was one of the last patients to be examined. I asked her if she was hurt, and she replied, "nothing to speak of," but felt a little sore in her back and a little bit nauseated. She was in the room with several other patients, and my attention was directed to her by the beginning peculiar uneasiness which is so characteristic and certain in these cases. She would sit in one position, then move to another chair, and as time went on the peculiar pallor manifested itself. She was admitted to the hospital at Omaha on the day following the injury. No evidence of any peritoneal irritation or inflammation could be found. The bowels, bladder and all secretions, as I remember, were normal. The following day there was a slight decrease in temperature, but all the time this increase and progressive uneasiness associated with the characteristic pallor that I have seen in every case of rupture of the liver that I have dealt with. On or about the fourth day she began to complain of pain in her head and of slight pain through the thoracic and abdominal regions. At first, there was only mild delirium, which increased as time went on. Repeated examinations, both manually and bimanually, with inspection of the abdominal regions and other parts of her economy, were undertaken by my colleagues. I diagnosed rupture of the liver. She died about the ninth day.

In the presence of fifteen physicians, an autopsy was made by Professor Crummer of Omaha. I was the only surgeon who had entertained the idea that rupture of the liver existed. Much to my humiliation, after the liver had been placed upon the table and many sections made through its lobes no rupture could be found. The balance of the thoracic and abdominal organs were removed, but nothing abnormal was found. Dr. Crummer at this time proposed that we open and explore the brain, believing that some lesion there had caused death. However, I was not satisfied with the apparently careful examination of the liver. I placed it on the table, and asked the doctor to make a few openings into the liver. There was, as I remember now, in the right lobe near the center, a space some three inches in width, and the left lobe of the liver was left intact. The characteristic discoloration, which was slight, prompted me to make an incision at this point. The first cut, extending through as described, opened up a cavity containing about four ounces of clotted blood, showing that the liver had been ruptured and that my diagnois was confirmed.

Another point concerning these cases is as regards the cause of this rupture. While, in a measure, we may state that ruptures of the liver are traumatic, how did the trauma occur in this case? There was not the slightest indication of any external violence, and in all other cases I recall the same condition existed.

I note the case spoken of, in which the man was hit by a lath and a triangular rent made in the small intestine. I do not believe these cases are the result of direct traumatism. Certainly no trauma was applied in the case that I have just reported. I believe these ruptures are due more to muscular action than to any other cause.

Dr. LORD—Authorities agree that a full stomach, or knuckle of bowel, which is so placed as to receive the injury, will rupture with slight force, so that the history and the amount of injury can not always be relied upon as showing the true condition of the case. Slight injuries sometimes produce disastrous results, but I think the rule is that considerable force has been applied in these cases.

Dr. Reed spoke of constipation as being a symptom in his case. I find in looking over the reports that constipation can not be relied on. While it may be rather commonly present, yet, in many cases, examination either during an operation or at the autopsy table has shown that quite extensive ruptures

have existed in the small intestine, and have not interfered with the action of the lower bowel, so that I think very little reliance can be placed on that.

In the cases of severe abdominal contusions which I have witnessed, there has been one symptom which is quite frequently noted, namely, inability to urinate, or symptoms of irritation referable to the bladder. In one of the cases I have seen there was momentary shock, but the patient suffered comparatively no inconvenience, and made a thorough recovery.

A rupture of the hollow viscera is very much more fatal than gunshot injuries. Many gunshot wounds are inflicted by instruments of small caliber, and such injuries may produce only a slight opening in the intestine, so slight indeed that the pouting of the mucous membrane is such as to completely occlude the aperture and prevent disastrous consequences, a plastic localized peritonitis being sufficient to cut off any escape of the contents. In dealing with these we can not treat them with the same "let alone methods" that we can cases where there is a wound or evidence of penetration.

One gentleman, in speaking of the method of relieving blood clots from the bladder in cases of rupture of the kidney, suggests that the suprapubic operation is preferable to the median perineal operation. The reason why the latter method is so regarded by most writers is because it affords drainage. Clots do not form; they pass out of the bladder as they accumulate. The median perineal operation is a comparatively simple one, and a drainage tube may be introduced which will carry off the clots and prevent their accumulation. While the suprapubic operation may be just as safely performed, although I am hardly willing to grant that, yet the complications, which afterward arise, in keeping the bladder clear of accumulated clots, would be evident, and I think that is the reason why the suprapubic operation is not regarded as highly as incision of the bladder with drainage. Other means may be used for evacuating blood clots, and if the hemorrhage can be arrested in the kidney, temporary removal of the blood clot might suffice. Breaking up the blood clots by instruments and withdrawal with an evacuator may be a preferable procedure. It has been suggested, also, that solutions of pepsin may be used for this purpose.

I think the point of determining the presence of a second kidney is a wise one. I saw the report of a case, by Phelps of New York, published in the *New York Medical Journal* quite recently, where a nephrectomy had been done for extensively lacerated kidney. The man died, and autopsy revealed the fact that the man had no other kidney. This occurs so frequently that it is well to be guarded before this operation is resorted to.

SOCIETY PROCEEDINGS.

Illinois State Medical Society.

Abstract of the Proceedings of the Forty-eighth Annual Meeting, held at Galesburg, May 17, 18 and 19, 1898.

The Society met at the Court House under the presidency of Dr. J. M. G. CARTER of Waukegan.

Prayer was offered by the Rev. W. H. Geistweit. An address of welcome, delivered by the Hon. F. F. COOKE, Mayor of Galesburg, was responded to by President Carter. After listening to and disposing of the reports of the secretary, treasurer, committee on publication and of various committees, Section 1 on Practice was called to order by the chairman, Dr. Arthur R. Edwards of Chicago; secretary, Dr. Frank P. Norbury of Jacksonville.

Dr. FRANK P. NORBURY of Jacksonville, read a paper entitled

MALNUTRITION IN INFANTS,

in which he said that the problem *par excellence* of an infant's life was that of nutrition. This was of great importance, as the days of infancy were dependent upon the ability of the infant to receive and assimilate nourishment. Nutrition was a physiologic chemic process which had for its object the supply of materials necessary to maintain the human economy in a state of health and to provide for its growth and development. Most all cases of malnutrition were the result of gastro intestinal disorders incidental to errors of diet. Over-education of the mother was responsible for her lack of ability to supply wholesome milk to the infant. Again, other conditions, such as excitement, worry, neurasthenia, the occurrence of menstruation or gestation, may produce unfavorable results upon the milk and thus disturb its nutritive value. Artificial feeding in a great many cases was responsible for indigestion in infants. This was the result of faulty methods of administration of foods and of the promiscuous and heterogeneous selection of food stuffs, prescribed by the neighbor or parent. The treatment had two main objects in view: 1, to arrest wasting; 2, to repair the damage done by the disease.

INFANTILE SCURVY, WITH REPORT OF CASES.

This paper was read by Dr. ISAAC A. ABT of Chicago. He said the earliest reported of these cases were erroneously described as cases of acute rachitis. Möller of Königsberg, in 1859, described his first case. In 1862 he reported two more cases, one of which came to autopsy. Bohn in 1868 described a similar case. The cases reported by various authors show a striking similarity with reference to the symptomatology of the disease. He said we were indebted to Cheadle of London, who described the disease in detail as infantile scurvy in 1878, and later as osteal or periosteal cachexia with scurvy. He then cited cases that had come under his observation to illustrate the course of the disease. Its etiology was discussed at length, as well as the symptoms pointed out.

The diagnosis, in well marked cases, was not difficult. With reference to the differential diagnosis, congenital syphilis could be excluded by the history of the case, by the absence of syphilitic lesions on the skin and mucous membranes. In congenital syphilis there was never a history of severe pain. The pseudo-paralyses of syphilis were nearly always limited to the upper extremities; the swelling was never so intense as in cases of infantile scurvy, and was more prone to occur on the epiphyses than on the diaphyses. Separation of the epiphyses occurred in both diseases. A spinal paralysis might be thought of, although in such cases there was neither tenderness nor swelling.

The prognosis, if the disease be recognized sufficiently early and proper treatment instituted, was fairly good.

As to the treatment, brilliant results were obtained by providing a suitable diet. Fresh cow's milk or mother's milk, beef juice, orange or lemon juice, fresh vegetables, mashed potatoes, recommended by Cheadle, were the most suitable articles of diet. The child should be placed under the best possible hygienic conditions; good ventilation should be provided for, and under favorable conditions of weather the child should be out of doors. Cod-liver oil by mouth or inunction was especially indicated, when the child recovered from the scorbutic condition, to aid nutrition. Iron should be administered in those cases where atrophy or anemia persisted. Vomiting, constipation, dyspepsia, diarrhea, must be treated by adapting the diet to the age and condition of the patient and by the use of appropriate drugs. Small doses of calomel, mercury and chalk, pepsin or bismuth, may be used as indicated. Care should be taken to overcome the constipation which was frequently present. For the swollen and bleeding gums a mild antiseptic and astringent solution should be used.

Dr. FRANK S. CHURCHILL of Chicago, followed with a paper on "Modified Milk," in which he discussed the laboratory method and home modifications of milk. He claimed that substitute feeding is the most valuable method for artificial feeding.

Dr. JAMES B. HERRICK of Chicago, read a paper entitled

THE DIAGNOSIS OF PLEURISY WITH EFFUSION, WITH ESPECIAL REFERENCE TO MISLEADING PHYSICAL SIGNS.

He first spoke of the importance of careful inquiry into the history of the case, and dwelt upon the fact that in some cases there might be an absence of pain and of cough, the clinical symptoms resembling those of a mild typhoid. In other cases the severity of the symptoms and the explosive onset would remind one of pneumonia.

Among the signs that might mislead, he mentioned the occasional inspiratory recession of interspaces and the decubitus upon the sound side. He regarded vocal fremitus as of relatively inferior value, because of the many conditions that might cause it to be retained even though there is a large amount of fluid. The importance of the sense of resistance was emphasized. With small amounts of fluid a careful examination should be made in the posterior axillary line just external to the angle of the scapula, for signs are often present here though absent elsewhere. Even with quite large effusions there is a triangular area of relative dulness above the line of flatness posteriorly. Here could frequently be heard quite pronounced bronchial breathing and well transmitted voice sounds.

The crucial test is exploratory puncture. With careful asepsis and with a knowledge of the anatomy of the thoracic viscera there was practically no danger. Negative results should not lead to the exclusion of pleurisy with effusion until circumscribed collections of fluid had been ruled out. By means of exploratory puncture bacteriologic and microscopic examination of fluid was made possible, throwing much light upon etiology, prognosis and treatment. Palpatory puncture, to

use Rosenbach's expression, may be of great value in the diagnosis of underlying tumor, and may be the only means of determining the presence of the thick fibrous plates that sometimes line the chest.

Dr. B. W. SIPPY of Chicago contributed a paper on

THE SIGNIFICANCE OF CERTAIN SIGNS AND SYMPTOMS IN HEART INSUFFICIENCY.

He said that the diagnosis of heart disease concerned itself not only in determining the particular lesion and its cause but, what was often of greater importance, in what manner was the diseased heart capable of performing its function? The author then dwelt upon the anatomy of the heart. He considered briefly insufficiency of the left and right hearts respectively and then, at length, total heart insufficiency. The left heart may become crippled in various ways. Owing to valvular defects at the aortic and mitral orifices, increased work thrown upon the heart by heightened arterial tension, as in chronic interstitial nephritis, the left heart may become incapable of doing its share of the work. Dilatation, compensatory hypertrophy of its walls and damming of blood in the pulmonic circuit takes place. The two sections of the heart sustain each other in their efforts to carry on the circulation. The passive congestion of the pulmonic vessels occasioned by the insufficient power of the left heart may be overcome by the right heart. As long as the right heart remains competent, the left heart lesion is compensated, the systemic arteries are filled more or less adequately, the systemic veins are emptied normally. The chief outward manifestations of this condition, dyspnea and cyanosis, are due to the overdistended pulmonic circulation. The right heart may become diseased independently of left heart affection, in the same manner that the left heart may become diseased independently of right heart affection. Increased tension in the pulmonic circulation due to pulmonary emphysema, fibroid phthisis, disease at the pulmonic or tricuspid orifices, results in similar pathologic sequences noted in left heart affections, namely, dilatation, hypertrophy and final damming of blood in the systemic veins.

The urine in heart insufficiency is diminished in quantity, highly colored, of high specific gravity, and as a rule contains a trace of albumin. Albumin may be continuously absent. As long as the degenerative changes of a nephritis are absent, the quantity of albumin will remain a trace. The hyaline cast, red and white blood corpuscles and epithelial cells, may be present. A considerable quantity of blood in the urine may be due to a kidney infarct. Such is the urine in kidney of passive congestion. The quantity of urine excreted in heart insufficiency is dependent much more on the diminished arterial tension in the kidney than on passive congestion, and is of great prognostic value.

In heart insufficiency the overdistended cervical veins stand out more or less prominently and the presystolic wave may become greatly exaggerated.

Dr. J. L. MILLER of Chicago, read a paper on

THE SMEGMA BACILLUS,

in which he drew the following deductions: 1. Over the entire surface of the body and exposed mucous membrane, and especially on the genitals, bacilli are found which resemble, morphologically and in tinctorial qualities, the bacillus of tuberculosis. 2. From the external genitalia they frequently gain access to the urine, especially in women, and may be a source of error in the examination of urine for tubercle bacilli. 3. The smegma bacillus presents wide variations in size and form, thus rendering morphologic differentiation frequently impossible. 4. While most smegma bacilli are more readily decolorized by any of the solutions commonly employed, occasionally they possess equal or even greater resistance than the bacillus of tuberculosis. 5, Methods of decolorization, where acids alone are employed, are fallacious; acid alcohol or dilute alcohols, unless long continued, are equally unreliable. Better, but not free from error, is the use of absolute alcohol for at least five minutes. In ammoniac urine, however, such prolonged use of alcohol may also remove the stain from the tubercle bacillus. 6. Attempts to remove the fat or fatty acids from the bacilli by ether, chloroform or other solvents, fail to furnish us with a means of differentiation. 7. We must rely on means of excluding the smegma bacillus from the urine. It has never been demonstrated in the bladder, and apparently seldom involves the deep urethra; therefore, by cleansing the external meatus and withdrawing the urine with a catheter, we can exclude this possible source of error.

Dr. GEORGE F. BUTLER of Chicago, spoke of the untoward action of drugs, with especial reference to hypnotic and antipyretics.

Dr. S. A. MATTHEWS of Chicago, read a paper on "A Pharmacologic Study of the Action of Digitalis on the Mammalian Heart and Circulation."

Dr. HUGH T. PATRICK of Chicago contributed a paper entitled

REMARKS ON THE TREATMENT OF NEURASTHENIA.

He said that for the production of neurasthenia, as for the production of nearly all disease, two conditions were indispensable, namely: 1, A noxious agent; 2, a relative vulnerability of the organism or of some part of it. The ratio of these two etiologic factors might be called the etiologic index. In some cases the first effect, that is, the extraneous agent, would be very prominent, the organism itself being considered as normal. In others, the exciting agent would be exceedingly slight, the inherent susceptibility or instability of the patient being an essential causal condition. Each of these two classes of neurasthenia would naturally need radically different treatment. In the first, those in which the patient once possessed of a normal nervous system, which had simply been overstrained and overdrained, the important features of the treatment would be rest and recuperation. In the second class of cases, those in which an unstable nervous system of the individual was at fault, the treatment is essentially mental, and the best way of administering it is by systematic education. For such patients isolation and an initial period of rest might be very useful, but for the further treatment gradually increasing physical exercise and mental occupation would be necessary.

A number of illustrative cases were cited to show the different types and the gratifying results of treatment varied in accordance with the classification before indicated.

Dr. M. L. HARRIS of Chicago described a new device for obtaining the urine separately from the two kidneys in either sex, and exhibited the instrument.

Dr. GEORGE W. COX of Chicago followed with a paper on

STREPTOCOCCAL INFECTION.

The author briefly discussed the subjects of puerperal septicemia, erysipelas, phlegmon, diphtheria, scarlatina, tuberculosis, and reported several cases of streptococcal infection, which he said could be easily detected and as easily cured, if the proper means were employed at the proper time. A microscopic examination would confirm the diagnosis and Marmorek's serum would accomplish the cure.

Dr. WILLIAM M. CATTO of Decatur read a paper on

URINARY FISTULA.

Urinary fistula may be congenital or acquired. The latter was most frequently encountered by the physician, and was nearly always due to violence, more rarely to disease. The various forms of fistulæ were mentioned according to their situation and the structures involved. The author closed his paper with a report of two interesting and instructive cases.

Dr. EMMA B. STANDLEY of Alexis contributed an interesting rhyme entitled, "My Name is Appendicitis."

Dr. GEORGE W. JOHNSON of Chicago read a paper on

OBSERVATIONS ON THE BLOOD OF TUBERCULAR PATIENTS.

These observations were made on patients in the advanced stage of the disease with cavities, and at times hemoptysis. As to the cause of the apparent anemia in tubercular patients, Cabot and others have found that it is not due to a reduction in the hemoglobin. The same authority states that in uncomplicated tuberculosis the number of red corpuscles remain practically normal. Dr. Johnson in his observations paid especial attention to the patient's physical condition as to cavities and hemoptysis. These observations were made just before meals, and no attack of hemoptysis occurred between the first and second examinations. The patients were up and out of doors most of the time during the day. The microscope was used to compute the blood count. Of thirty-three patients examined, all had cavities of various sizes and all had had hemorrhages or hemoptysis. Of these thirty-three cases, twenty-five were found to have leucocytosis, that is, the white cells ranged above 7500 per c.mm. The twenty-five having leucocytosis also showed cavities. Cabot and others state that there is always a leucocytosis when there are cavities and after hemorrhages. Nine of the thirty-three showed a red blood count of 5,000,000 or above, which Cabot states as a normal basis. The remaining twenty four showed a red cell count, in many instances far below 5,000,000, and in no case was the hemoglobin up to normal. In only one case did it reach 75 per cent.

Having made observations to determine the character of the blood, he also made some therapeutic observations, using 5 per cent. nucleinic acid, No. 2, in the first ten cases; 5 per cent. nucleinic acid, No. 1, in the second ten cases; ferratin in six cases and heminol in five cases. The first ten were given 22 c.c. every four hours for twenty-four hours. The second blood observation in the first ten cases showed six out of the ten to have a still greater leucocytosis. The red blood count was practically unchanged. The hemoglobin showed an

increase of from 3 per cent. to 10 per cent. in those cases in which there was a leucocytosis. The second ten were put on the nucleinic solution, No. 1, which is chemically pure and for hypodermic use. Thirty minims were given hypodermically every four hours for twenty-four hours. The second count in these cases showed the same condition as in the first ten, which were given the No. 2 solution by the mouth. None of the patients complained of any bad effects, but experienced a sense of renewed energy, the circulation being better and the appetite improved. The speaker has noticed repeatedly the splendid stimulating effect of nucleinic acid in every case in which he had used it. In cases not tubercular he has had splendid results.

Five cases were put upon heminol, 15 grain doses being given every four hours for thirty-six hours. A second examination of the blood of these patients showed an increase in the number of the red cells in four cases. Three showed an increase in the number of white cells, and only two showed an increase in the percentage of hemoglobin. The blood of the thirty-three cases was stained and studied, and in but two cases was there found a poikilocytosis.

Dr. H. W. CHAPMAN of Whitehall spoke of an undescribed form of la grippe.

Dr. A. C. COTTON of Chicago talked upon the subject of infant feeding at home and abroad. He gave an interesting description of the different forms of infant foods which he saw in foreign countries during a recent trip.

Dr. L. R. RYAN of Galesburg read a paper on "A Positive Antidote for Strychnia." The contribution was the result of a good deal of experimental research. The antidote in question is leontin. He detailed his experiments upon animals.

Dr. C. C. HUNT of Dixon followed with a paper on

CHELIDONIUM MAJUS IN INOPERABLE CARCINOMA.

He stated that Dr. Denicenco first experimented with chelidonium in cancer of the lip, and having obtained good results he used it in inoperable cancer. Dr. Hunt had used it in three cases, and while he would admit that the action of the remedy as observed in them was not absolutely conclusive, yet the results appear to corroborate in the main the claims advanced by Dr. Denicenco. Dr. Hunt concludes that: 1, chelidonium majus, injected interstitially into the substance of a carcinomatous growth, tends to its obliteration by necrobiosis; 2, copious and frequent interstitial injections of the fluid extract are unattended with danger to the patient, if judiciously used; 3, in cancer of the rectum, even at an advanced stage, stenosis may be prevented and the necessity of palliative colotomy obviated; 4, it is a deodorizer of no mean power; 5, there is some warrant for the belief that it has a favorable influence over glandular infiltration and tends to prevent metastasis; 6, it is a hemostatic and antiseptic; 7, it gives the patient hope of ultimate recovery, and this tends to mitigate or annul the awful apprehensions of impending dissolution, apprehensions, we may well opine, more appalling than death itself; 8, more comprehensive and exact experiments are necessary in order to determine the real value of the drug.

(To be continued.)

American Medico-Psychological Association.

Fifty-fourth Annual Session held at the Southern Hotel, at St. Louis, Mo., May 10–13, 1898.

(Continued from page 1295.)

FIRST DAY—EVENING SESSION.

Dr. E. N. BRUSH read a paper by Dr. C. W. PILGRIM, entitled "Does the Loco Weed Produce Insanity?" The author, incited by a statement by a popular writer of fiction, had investigated this subject and reported an interesting case attributed to this cause, but which appeared to be rather due to specific infection.

The next paper read was by Dr. B. W. STONE of Nashville, entitled "Thyroids in Insanity." He said that his experience with this agent had been most favorable and that he would try thyroids in every case. He read reports of a series of cases of remarkable results of thyroid treatment including one of agitated dementia of over four years duration, nearly well at the present time. Ill success in treatment is often due to insufficient dosage. He had it carried up to 55 grains daily in robust men, had at times had alarming effects on pulse, etc., and thought it ought to be carried out only in asylums.

Discussion was by Drs. Burr, Bancroft (unfavorable experiences), Brush (ditto), Burgess (worthless except in some cases of stuporous melancholia, experience has simmered down to this). In one case of latent phthisis it probably killed the patient.

Dr. HILL suggested the subject might be one for inquiry by the Association. He had used thyroid from an early date and his enthusiasm still exists. He would think he had neglected his duty if he had not used it in some cases. He did not use large doses (7-15 grains sufficient), has made motor disturbances a guide, but has abandoned it in melancholia, perhaps because he did not use a sufficient dose. Thyroids decrease excretion of solids. He has experimented with suprarenal extract and found the opposite effects. How is it the loss of weight occurs? His pathologist, Richardson, suggests it is due to breaking up of hydro carbons into CO_2 and OH_2. A suggestion was made as to its value in diabetes and he reported a case in which in one month there was reduction of 63 grains of sugar with undiminished urine. Dr. Brush, reporting a contradictory result, added that three cases at Sheppard that were positively deranged were cases of diabetes.

Dr. MABON had used thyroids and found great results in stuporous cases.

Dr. BANCROFT asked about blood changes and what preparations were used.

Dr. MABON said that he was having blood examinations, but was not ready to report; he had used Parke, Davis & Co.'s preparation.

Dr. BUCKE had had lack of results.

Dr. HURD had had remarkable results in some cases, but in mental diseases he had not had good results with this remedy.

Dr. EDWARDS asked what was the effect on the thyroid gland itself.

Dr. STONE, in closing, stated that he had used both Armour's and Parke, Davis & Co.'s preparations. In all cases with improvement there was an increase of ruddiness, but he had made no special examination of the blood.

SECOND DAY—MORNING SESSION.

After miscellaneous business, reports of Finance Committee, report on candidates for membership, etc., had been attended to, the President called for the report of the Committee appointed on the treatment of the criminal insane. In the absence of the chairman, Dr. CHAPIN, Dr. H. E. ALLISON offered the report, the conclusions of which were as follows:

1. That medical officers connected with all penal institutions should possess an experience in a general hospital or should have manifested a fitness for the position by a successful general practice, and should have, in addition, some experience in the treatment of the insane.

2. The compensation for such services should be adequate to secure competent and well qualified men, and that the position should be a reasonably permanent one, dependent upon merit and efficiency and not upon political influence or personal preference; that the duties of such physicians be so defined by law that in the discharge of his professional work he can exercise an independent judgment and possess an authority sufficient to control his medical functions.

3. That there shall be kept at all prisons a record on admission of any mental or physical peculiarities, and that entries shall be made from time to time of any additional peculiarities or actions and that each case report shall be in permanent

4. That so far as practical, special hospitals for the insane form and at all times accessible to the proper authorities. criminals be erected as an adjunct to the courts and prisons, where the insane criminals may be transferred and therein detained, without regard to the length of sentence, until recovered or otherwise so improved in mental and physical condition for release.

5. That the attention of the National Prison Association be directed to this subject with a view to securing their co-operation in providing better facilities for the detention and proper custody of the insane in the prisons of the United States.

On motion of Dr. H. M. HURD, the Committee was continued and authorized to co-operate with the National Prison Association, and it was ordered that the report be published in the *American Journal of Insanity*.

Dr. C. P. BANCROFT, for the Committee on Nominations, reported as follows: President, H. M. Hurd of Baltimore; of Michigan; auditors, H. A. Tobey and C. B. Hull; council vice-president, H. A. Gilman of Iowa; secretary, C. B. Burr three years, L. C. Meade, C. W. Babcock, C. D. Page and L. P. Wade. These officers were elected.

Dr. HURD then reported on the *Journal of Insanity*, showing a balance of over $500 on hand in cash and good accounts.

Dr. MURPHY reported for the auditors, and Dr. Burr on the proposed amendment of the constitution, making eligible for membership those who by their writings and qualifications in the specialty of nervous and mental medicine were considered worthy aside from any hospital connections. The reports were accepted and adopted.

Dr. C. P. BANCROFT read a paper on "Subconscious Homicide and Suicide; their Physiologic Psychology." He discussed at length the the theories of consciousness and its aberrations and reported two cases occurring in apparently non-epileptics, in which homicide or suicide had been attempted in a state of suppressed or modified consciousness. Such cases of non-epileptic automatisms were of the greatest psychologic and forensic interest, and he reviewed at length their possible explanations.

Dr. H. E. ALLISON next read a paper on "Insanity and Homicide." He explained the methods and results at the New York Asylum for insane criminals at Matteawan. The crimes of the insane are mainly against persons. They had there 398 cases with records of successful or unsuccessful attempts against life, and 24 per cent. of those given life sentences in the State were inmates of the criminal asylum. His paper contained statistics showing the ultimate relations of insanity and crime and some striking cases were reported. In conclusion he called attention to the following needs; special hospitals for the insane in connection with the courts and the penal institutions of our larger States; more thorough examinations by the courts, of the mental conditions of persons charged with crime; better methods of obtaining medical expert testimony; the granting of greater powers and authority to prison physicians; more extensive clinical records in the prisons; and the acceptance of the doctrine that dangerous lunatics should be confined until mentally fit to be at large.

Dr. B. H. HILL spoke of recent legal decisions modifying criminal practice in Iowa courts as an advance in the right direction.

Dr. BANCROFT'S and Dr. Allison's papers were discussed by Drs. Tomlinson, Woodson, Harrington, Robinson, Eastman and Brush.

There was no afternoon session but the members were given a carriage ride through the city and parks, taking in the principal points of interest.

SECOND DAY—EVENING SESSION.

The annual address was delivered by Dr. J. T. ESKRIDGE of Denver, on

THE MUTUAL RELATION OF THE ALIENIST AND NEUROLOGIST IN THE STUDY OF PSYCHIATRY AND NEUROLOGY.

He spoke of the close alliance of the two specialties. The expert alienist ought to know something of everything in medicine and everything on psychiatry; he must necessarily be an expert neurologist. It follows that the study of mental ailments is the same in essentials as that of obscure nervous diseases. With the asylum physician it is especially difficult because the required history of the case is so often unattainable; were it not so, much would be clear that is now obscure and it is to the carelessness of the neurologist and general practitioner, in this respect, that is due much of the blame for the backwardness of psychiatry in this country. The speaker gave the essential points of the examinations and the requirements of a hospital. He dwelt especially on the examinations of usual as well as of emotional states, the condition of the memory, etc. Among all the hospital appliances were mentioned pathologic laboratories and their work, and a list of the institutions in which they existed were given. The neurologist is called upon to treat and care for many cases and phases of mental disorder and a practical knowledge of mental disorders is as useful and essential to them as is that of neurology to the alienist. It is only when the neurologist has become a practical alienist that he could greatly criticize the alienist. The neglect of training and instructions on mental disease in our medical schools was remarked upon as a cause of misapprehension and mistakes. A general plan of an ideal insane hospital was laid down in detail. The qualifications, duties and privileges of medical directors, assistant physicians, the proportion of the medical staff and attendants to patients, training schools for nurses, scientific associations, consultants, psychologic research, etc. The time would come when the recognizably best neurologists would be those who had had training in hospitals for the insane, and it is only in the combined and harmonious action of both alienists and neurologists that we are to look for real progress. A union of the Medico-Psychological and the Neurological Associations was suggested as a proper end to work for in furtherance of the common aim.

The president presented to Dr. R. S. DEWEY, on behalf of the Association, a massive silver pitcher, in appreciation of his work in carrying on the *Journal of Insanity* for three years. Dr. Dewey responded, expressing his thanks.

Dr. ESKRIDGE presented the invitation of the physicians of Denver to the Association to attend the meeting of the AMERICAN MEDICAL ASSOCIATION there. Dr. Hughes endorsed this as chairman of the Neurological Section.

Dr. WOODSON offered the hospitalities of the St. Louis Club and of the public libraries.

THIRD DAY—MORNING SESSION.

The report of the Council was offered and report on members and ballots cast for those recommended by the Council. New York was fixed upon as the next place of meeting, the date to be hereafter arranged and notification by the Secretary. Committee of Arrangements: P. M. Wise, A. E. Macdonald, B. Sachs, and Frederick Peterson. The report was adopted.

Dr. MURPHY finished the report of the Auditing Committee.

The Committee on Training Schools reported progress and was continued.

For the Committee on After-Care of the Insane, Dr. Dewey stated that a report had been made to the Conference of Charities last year and arrangements made for continuing the work. The report was accepted and adopted. Dr. Brush was appointed to attend the Conference of Charities and represent the Association, in addition to Dr. Dewey.

The first paper of the day was by Dr. R. S. DEWEY, entitled

SOME REMARKS ON THE RELATION OF MENTAL DISEASE AND SURGICAL OPERATIONS, WITH REPORT OF FORTY CASES OF INSANITY FOLLOWING SURGICAL OPERATION.

He, out of some five thousand insane, had met with eight cases of insanity following surgical operations in sound individuals, and many more in those with an insane or neuropathic taint. He presented a tabulated statement of forty-six cases, stating prior conditions, operation, anesthetic used, occurrence of shock, mental states following operation, duration of insanity, outcome of operation, etc. The class of operations followed by mental disorders were, in order of frequency, those on the genito-urinary organs, the eye and the mammary glands; operations on the brain were excluded, and with this exception the proportions of such cases in asylums was apparently not over 1 per cent. The sources of error in the statistics were dicussed at some length, misunderstandings of insanity, the ignorance of surgeons on this subject and their lack of study. The importance of the surgeon giving careful attention to the mental state of the subjects of operation as a prophylactic of insanity was emphasized.

The paper was discussed by Drs. Hurd, Tomlinson, Bancroft, Russell, Bannister, Punton and Woodson.

Next followed a series of papers, all bearing on the care of the insane, which were read consecutively, the discussions being postponed to the last. The first was by Dr. J. RUSSELL of Hamilton, Ont., on

ASYLUM VERSUS HOSPITAL.

The paper was a well-written plea for more conservative methods as compared with the tendencies of the time to assimilate all the institutions for the insane to general hospitals, with their active operative tendencies and scientific examinations. He gave a historic review of the use of the terms asylum and hospital, and remarked that in the list of institutions for the insane in the United States and Canada there were ninety-three hospitals and forty eight asylums. The word "hospital" was a misnomer as regards institutions for the insane, and their evolution must be along industrial rather than hospital lines. Mental and physical activity is the note that must be struck in the care of the insane, control in some cases, arouse in others and in all restore their brain's normal activity on a physiologic basis. He gave his ideal of the twentieth century asylum, treatment by regulated activity, and with this increased recoveries, success and economy. It is the duty of the alienist to instruct how to produce and how to live. The paper closed with a plea for the mental and moral treatment of insanity as opposed to the physical or modern scientific medical treatment.

Dr. W. M. EDWARDS read a paper on "Some New Hospital Buildings." He described and exhibited plans of new additions to the Michigan Hospital at Kalamazoo, and advocated the use of detached buildings for recent and curable cases.

Dr. B. D. EASTMAN'S paper on

STATE VERSUS COUNTY CARE FOR THE INSANE,

followed. After stating the present conditions in Kansas, he reviewed the question of State and County care in other parts of the country and gave especial attention to the contrasted methods adopted in New York and Wisconsin. He considered the Wisconsin claims excessive and held that this was confirmed by the report of the Pennsylvania Commission that treated of the subject, and analyzed the claims of the advocates of the asylum, Wetherill, Heg and others. The objections to the two systems were respectively: New York, care of the insane is too expensive, the institutions are too widely separated, there is less employment; Wisconsin, imperfect medical supervision, absence of classification, necessity of keeping all

the ill, feeble and dangerous cases in the State hospitals, lack of diversions, over-economy of rural authorities, lack of adequate inspection. The economy of the Wisconsin plan was, he thought, over-estimated. He summed up in conclusion, the advantages and disadvantages of each plan, and gave as his ideal system, State care in numerous small, well-equipped hospitals.

Dr. H. A. GILMAN'S paper on "Better Care for the Chronic Insane" followed the same general line of thought. He objected to the plan of county care as introduced into Iowa. The lack of individual treatment was a great objection in these county institutions.

THIRD DAY—AFTERNOON SESSION.

Dr. W. B. LYMAN opened the session with a paper on

THE WISCONSIN COUNTY CARE SYSTEM.

He claimed that Wisconsin has a system peculiar to itself, satisfactory to its people, and one that solves the question of the care of the chronic insane. A description was given of the county asylums, their relation with the State hospitals, the methods of transfer, etc. A lack of the system was the need of accommodation for chronic dangerous cases. He advised the commitment of chronic patients directly to the county asylums, instead of through the State hospitals as at present. After describing the condition of the State hospitals, he enumerated the advantages of the county institutions. Open doors were the rule, 70 per cent. of the inmates were on parole and a large percentage of occupations. Wisconsin has fewer deaths from tuberculosis in its insane than any other State. Other advantages were, more frequent visits from friends, the general popularity of the institutions. The Board of Control had full authority and responsibility, and under their system persistent abuse could hardly exist undiscovered.

Dr. F. C. HOYT'S paper on

OCCUPATION IN THE TREATMENT OF THE INSANE,

closed the series. He spoke of the advantages of rational occupation for the insane; it is the best method of preventing secondary mental degeneration, if employed under the careful and judicious oversight of the physicians and not of the lower grade of employes. The patient's own taste should be consulted; also his health and feelings. Open doors and paroled wards, if careful discrimination was not exercised, had a tendency to make idlers and hospital loafers; a parole should be earned by industry and good behavior. Speaking of occupation as a therapeutic measure, he thought it should be in small doses at the beginning and gradually increased till the full physiologic effects were obtained.

Dr. WOODSON, in the discussion, said he could not see the necessary connection between economy and small asylums, other things being equal; why should it cost less per capita in an institution with sixty or seventy inmates than in one with four hundred or five hundred. He described the night attendance at Fulton and the open dormitories. As regards occupation, he agreed thoroughly with Dr. Hoyt's paper. Abuses might occur anywhere but he had noticed that the public condoned them in a county asylum while condemning them in a State institution.

Dr. BURR said the Wisconsin asylum could hardly be called a success as yet. The real improvements are generally quite recent. The claims of economy and humanity were justified as regards the first element more than the last. He had visited the Wisconsin asylums in the winter time and had seen a lack of occupation and diversion, no books, pictures, etc.; that made the places dreary. It was admitted by the intelligent employes that the patients deteriorated in them. Among fifty-eight inmates of one institution there were fifteen with goiters, attributed by the visiting physicians to a lack of oxygen. The attendants were less watchful than he thought desirable, and while they claimed there was no trouble, he saw a patient with a black eye that looked suspicious. The nearness to home was sometimes an aggravation and was not a security against abuse. One official confessed to choking a patient as a disciplinary measure, and he heard stories of neglect, abuse and trouble. Political considerations were not entirely abolished in the management, and generally he had not found what had been expected from the claims made for the asylums. When the defects were done away with, the Wisconsin propaganda would be better justified, but not till then.

The papers were further discussed by Drs. Brush, Runge, Tomlinson, Gilman, Gordon and Gardner.

Dr. J. M. MAHON then read a paper on "The Value of Hospital Records," which was chiefly an exposition of a system devised for the New York State Hospitals, simple, thorough and labor saving, and which greatly facilitated the keeping of case records.

FOURTH DAY—MORNING SESSION.

The first paper read was by Dr. R. H. HUTCHINGS on "Practical Methods in Physiologic Chemistry." He described the methods used at Ogdensburg in the clinical study of the excretions, the blood, etc., and explained how, by the division of time and of the medical staff, this was made readily practicable.

Dr. A. H. HURD testified to the reflex value of this work on the staff and its influence on the patients who were led to take an interest in their own cases that aided in their treatment and led to a better feeling towards the physicians.

The paper was also discussed by Dr. HUGHES, who spoke of the methods as an antemortem pathology tending to more scientific practice and diagnosis; by Dr. W. O. KROHN, who described the psychologic investigations in Kankakee; by Dr. EDWARDS, who told of the methods in use in Michigan, and others.

Dr. BRUSH then read an outline of Dr. BABCOCK'S paper entitled "A History of the Insane in America. Shall the Association have one Prepared?" He moved that an editorial and revisory committee be appointed for such purpose; that Dr. Babcock be appointed chairman, with authority to name his colleagues, and be directed to report at the next meeting of the Association. Carried.

Dr. A. M. GARDNER'S paper on "The Insane in California," was then read. He mentioned the prevalent belief in the undue frequency of insanity in California, and gave the reason. State care was the system adopted, and he made a comparison with New York and Pennsylvania. The large foreign element in the insane was remarked, as shown for example in the Manhattan Hospital report. California has a predominence of foreign-born insane committed. The large cities and seaports are responsible for this, with the increase of urban population. Five-twelfths of the population of California is in the cities. More out of door agricultural life would improve the conditions. California is also the tramp's paradise, and these degenerates often find themselves finally in the asylum. The climate of California, by attracting the defective and degenerate, tends to increase the number of insane. Many of these immigrants err in their choice of residence in California, and this affects the figures. He mentioned the relation of tuberculosis to insanity, and said that its extensive introduction had already been felt in the increase of the insane. Narcomania was also more prevalent; the Chinese in introducing the opium habit had made a curse for the present and a danger for the future. With all this it could not be said that insanity was greatly increasing in the State; the commitments in 1898 were only eight in excess of those in 1886, which is an encouraging figure.

Memorial notices of Dr. GEO. ALLEN by Dr. TALCOTT; Dr. MOFFAT by Dr. GILMAN; Dr. MCNARY; Dr. W. H. JONES by Dr. BEAUCHANT, and of Dr. OLMSTED by Dr. W. S. NOBLE, were read by title and referred to the Secretary, who was authorized to have them published in the "Transactions."

Dr. C. R. WOODSON'S paper on "Some Forms of Syphilitic Insanity Resembling General Paresis," was next read. The author described certain types which he considered as indicating a difference between paresis and syphilitic insanity.

The paper was discussed by Drs. Runge, A. E. Macdonald, Hoyt, Gundry, Eskridge, Burr, and others.

The following papers were read by title: "The Nerve Cell Changes in Somatic Diseases," by Aug. Hoch, Waverly, Mass.; "A Short Study in Psychic Phenomena," by H. C. Eyman, Cleveland; "The Lesson Taught by a Few Hard Cases," by W. E. Dold, White Plains, N. Y.; "Hospital Treatment for Acute Insanity," by A. B. Richardson, Columbus; "The Boarding Out System in America. Why Not?" by G. Alder Blumer, Utica, N. Y.; "Incipient Melancholia—Its Diagnosis, Prognosis and Management," by John Punton, Kansas City, Mo.; and "Experimental Mania," by T. J. W. Burgess, Montreal, Canada.

Dr. MACDONALD reported that he had represented, as commissioned, the Association at the British Medico-Psychological Association and International Medical Congress.

Dr. BURGESS moved that Dr. Macdonald be delegate to the British Medical Association and British Medico-Psychological Association the coming summer. Carried.

Therapeutic Castration is the term applied by Rivière to the effect of thyroid medication in a couple of cases of arthritic obesity. The genital functions seemed to be suspended during the months of treatment, a phenomenon not noted before, but suggestive as extending the indications for the treatment to congested prostates.—*Semaine Méd.*, April 27.

Chicago Academy of Medicine.

Regular Meeting, March 18, 1898.

(*Continued from page 1294.*)

JAMES G. KIERNAN, M.D., in the Chair.

THE EFFECT OF PREGNANCY UPON TUBERCULOSIS.

Dr. C. E. PADDOCK—What effect has pregnancy upon tuberculosis? The usual answer to this question and the popular opinion is, that the result is beneficial; that the patient takes a new lease upon life. That this opinion is based upon good grounds is shown by numerous examples which any of us may recall. When we remember the changes which occur in the pregnant woman, it seems all the more plausible. We find an increase in the blood supply; the organs generally are more active; the skin becomes more hyperemic; the urine is increased in amount; the heart is enabled to meet the greater requirement which the condition demands. These changes are placing the woman in the best possible condition for the ordeal. In a tubercular pregnant woman we have emaciation, lowered vitality, anemia and every outward evidence of disease. The changes taking place, as enumerated, to prepare her for maternity, are unable to meet the requirements.

Normally, pregnancy is a physiologic process, but it borders so closely upon the pathologic that we are often called upon in the course of the pregnancy to give advice or treatment. For instance, the nausea, which occurs with such a regularity that it is largely considered in making our diagnosis as to the probability of a case of pregnancy. Ordinarily this does but little harm and yields to treatment. In a tubercular case, however, it is not so easily controlled, and in such cases has a very unfavorable influence. The woman's power of resistance would be lowered and the progress of the disease hastened. Not so much attention to this subject has been given as we would naturally expect, and our text-books hardly give it a thought. So far, scientific investigation does not aid us in determining the question as to the effect of pregnancy upon phthisis, and we must rely upon statistics and our personal experience.

In looking over the cases reported I find them about as this:

Case 1.—Patient pregnant two months, anemic, poorly nourished, tubercular. Dies before child is viable.

Case 2.—Same as No. 1. Lives to deliver child at term, and dies in a few weeks.

Case 3.—Pregnant, missed one period, tubercular. No external symptoms of the disease. Child born at seven months, dead. Mother lives but a few days.

Case 4.—Pregnant two months. Emaciated, every external evidence of the disease. Gave birth to a vigorous child. Lives to become pregnant again, but succumbs to the disease.

Now, these are every-day cases which come to our notice, and these are the cases we find reported in looking up this subject, and are of very little assistance. I believe, ordinarily, pregnancy does exert an unfavorable influence upon tuberculosis. It is often unwelcome. The patient becomes morbid. Soon we have nausea with loss of appetite; the patient refuses to take proper exercise, and everything is favorable to the progress of the disease. Her power of resistance is lowered and the vitality is not sufficient to support two beings. There are cases which surprise us in every branch of medicine. Notwithstanding our unfavorable diagnosis, they recover. So also there are cases in obstetrics that are tubercular and accompanied by pregnancy which seem to improve. But these cases are rare. Where we find one of such we will find one hundred made worse by gestation.

Having a case of tuberculosis complicating pregnancy, what is the proper treatment to pursue? Shall we interrupt pregnancy or leave the case to nature? I report two cases in my practice:

Case 1.—American; 30 years; blonde; never robust, but always considered in good health; four children in five years, fifth pregnancy occurring six months after last child was born; dulness in right apex, no cough, slight evening temperature; abortion at second month after consultation, patient anesthetized, cervix dilated with Hegar's; curetted.

Following this, the patient seemed to have a little more temperature, there being a slight rise both morning and evening; seemed to take a mild typhoid course for four weeks; no pelvic trouble; recovered slowly and soon went to the seashore and White Mountains in apparently good health. After an absence of eight months she returned four months ago; both apices involved; sent to New Mexico; has received no benefit, and death hourly expected.

Case 2.—American, age 24 years; blonde; second pregnancy; active, apparently healthy and great endurance. Two months previous to second pregnancy glands in neck were removed; tubercular; no other evidences of the disease. Pregnancy was complicated in the last month by hydramnios. A few months after delivery the patient left the city in apparent good health. Two years from date of delivery she died of pulmonary tuberculosis.

Case No. 1, I believe, was helped by the induction of abortion. I was enabled to institute treatment which would have been impossible in the pregnant state. In the second case the progress was certainly interrupted, but can we say that pregnancy was the cause of it?

In 1890 Dr. William Duncan[1] reported a case of interruption of pregnancy in a tubercular woman. This communication provoked a discussion which was, with but one or two exceptions, opposed to his line of treatment. Drs. Priestley, Routh, Playfair, Napier and others took part. Dr. Routh thought that most obstetricians had observed that the progress of lung destruction was at a standstill during pregnancy, but became very active during lactation. Dr. Playfair believes "that in the greater number of cases the mother is doomed, and everything should be done in the interest of the child. To say that pregnancy should be interrupted in any stage of phthisis and at any period in pregnancy is too broad a statement and gives too much latitude to the physician, and should not be tolerated." Cullen of Edinburgh asserted that phthisis in pregnancy was suspended or retarded, and such was the belief by others for years until M. Gaulard of France, took the other side and made the positive statement that there is no interruption in the progress of tuberculosis in pregnancy any more than there would be interruption of any other disease in the same condition. Dr. Priestley,[2] in a paper read before the London Obstetrical Society in 1880, laid it down as a rule "that abortion was only a legitimate operation when the life of the mother was imperiled by the continuation of pregnancy, emptying the uterus presenting itself as the only alternative to save the patient."

What evidence have we that this does prove the only means of saving the woman? and again, if we do produce abortion, what excuse have we for not doing it again and again? Once in a great while we will encounter a case who lives a long time and, as these cases of phthisis for some reason conceive very rapidly, if we operate once we will be called upon in such a case to do so again. There is not evidence enough to warrant us in asserting that the interruption of pregnancy means a saving of the life of the mother, and neither can we justify such a procedure by saying that an inferior child would be brought into the world.

My case No. 1 is not unlike nearly every case I can find recorded. The case was only benefited temporarily. A fetus was sacrificed which might have developed into a healthy child, for not all children born of tubercular parents are themselves tubercular or puny. I can see no justification for such treatment.

My conclusions are based upon clinical facts as presented by others and upon my personal observation:

1. Pregnancy does exert an unfavorable influence upon tuberculosis in the majority of cases.
2. That the case is progressive and not arrested.
3. That only in exceptional cases, as in advanced tuberculosis with the child viable and mother about exhausted, are we justified in terminating pregnancy, and then only after a consultation with two or more reputable physicians.

GENERAL REMARKS ON TUBERCULOSIS.

Dr. ROBERT H. BABCOCK—We should regard pulmonary tuberculosis and consumption as somewhat different. The former is a pure and unmixed infection, which is amenable to treatment. It is in this stage of the disease, when the infection is unmixed, that we get our cures. Consumption is a mixed infection, and when this secondary infection has advanced to any considerable degree, the prospect of an arrest of the disease is bad. Our efforts, therefore, should be addressed to the recognition and treatment of pulmonary tuberculosis while it is still tuberculosis, and not consumption.

I was greatly interested in Dr. Paddock's paper concerning the influence of pregnancy upon phthisis, and agree with him fully that the course of the disease is unfavorably affected by pregnancy. I should go farther, however, and say that in my experience, although I have no statistics and have not had time to look up my records, pregnancy can be regarded as an etiologic factor in the production of pulmonary tuberculosis. Women with an hereditary predisposition to consumption, certainly in my experience, have the disease hastened and often developed while carrying the child. I have frequently observed cases, have in mind one now, in which pulmonary dis

[1] Dr. Wm. Duncan: Trans. London Obstet. Soc. 1891, Vol. xxxii, Lancet. 1890, p. 134.

[2] Dr. Priestley: London Obstet. Soc., Vol. xxii.

ease developed within a few weeks after parturition, before the injurious influence of lactation could be manifested. I do not agree therefore with those physicians who recommend pregnancy to women of tubercular tendencies, on the ground that it will prove a physiologic tonic. They are too frequently in a state of lessened nutrition to stand the further drain made upon their vitality in nourishing their children, and in such an event pulmonary tuberculosis is very likely to supervene.

Hemoptysis is one of the symptoms of pulmonary tuberculosis which is justly regarded, both as a serious one, and also looked upon as a symptom that ushers in pulmonary tuberculosis. I shall briefly speak of two cases of hemoptysis that have recently come under my observation. One was a male who consulted me the day after he had twice expectorated blood the previous evening. Examination of his lungs was negative, although I was not altogether pleased with the findings in the right apex. He was sent to a throat specialist, who reported a large number of dilated veins in the pharynx, larynx, and far down in the trachea, some of which showed evidences of recent rupture. I believe this was a case of what Powell designates false hemoptysis, and that the patient was not tubercular, but to settle the question I gave him three diagnostic doses of old tuberculin. The result proved the correctness of my opinion, for none of these injections was followed by any reaction whatever. The second was the case of a female who had expectorated blood at intervals since December last. Examination of her chest was negative, except that at the left apex the respiratory sounds seemed to me not quite as vesicular as they should be. Her throat was also examined, with the result that some dilated veins were found at the root of the tongue. Three injections of tuberculin at proper intervals were given to this patient with the same result as in the other. There was absolutely no reaction, the temperature having been in this case, as well as in the other, taken regularly, and faithfully recorded.

These cases illustrate the importance of careful investigation of those cases which consult us because of hemoptysis, and a cautious opinion that they indicate the incipiency of tuberculosis of the lungs before they have been sifted to the bottom, and the presence of the disease established, or satisfactorily shown not to exist.

The more experience I have with pulmonary tuberculosis, the more impressed I am with the fact that we are likely to meet with surprises. We not infrequently encounter cases of acute phthisis which are illustrations of acute, confluent, tuberculous bronchopneumonia, in which the patient loses strength and emaciates rapidly; the lung rapidly goes on to softening and excavation, and there seems to be every prospect of a fatal termination within a few weeks. At length, however, just as it seems the patient's strength can not hold out much longer, the lung begins to give evidence of a change for the better, the symptoms improve, and the patient ultimately develops a case of chronic phthisis, and under a favorable environment in a proper climate may even have an arrest. The cases which to my mind furnish an absolutely unfavorable prognosis from the start are those in which there is a disseminated peribronchial tuberculosis with secondary bronchitis. The persistent elevation of temperature; the paroxysmal and uncontrollable cough; the rapid wasting and loss of strength, all the symptoms, in short, are out of relation to the fewness of the physical signs observed. These are the cases which resist all treatment.

I have used Dr. Fisch's serum in six cases. In five the results have been highly gratifying. In one, a young man who came to me with hemoptysis, last July, and in whom there were signs of incipient disease of the left apex, bacilli were found in the very scanty sputum. This young man was placed upon the use of this serum in September last, and it alone, with the result that today the signs in the left apex have almost disappeared. In other words, the active disease process in that apex has disappeared, and there are only left the signs of the ordinary fibroid transformation which takes place in some of these cases. So gratifying was the result of treatment that about two weeks ago I decided to give him tuberculin for the purpose of deciding whether or not immunity had been established in his case. Two test doses were given without any reaction. A third test dose of ten milligrams of old tuberculin were administered, and for twenty-four hours there was no reaction whatever; then suddenly reaction took place, demonstrating that his system was not rid of the disease. Several careful examinations of his lungs, since then, have shown absolutely no irritation from the tuberculin in the former seat of pulmonary disease, and therefore I am forced to the conclusion that in his case there is glandular infection, probably intrathoracic, to which the marked reaction is to be attributed.

Another case was that of a man, whom I first saw last April, with disease of the left apex, and who, under ordinary constitutional treatment, improved somewhat during the spring and summer, and reappeared at my office for examination in September with every evidence of extension of the disease in that lung. General measures had failed to do more than to hold him *in statu quo* up to that time. I advised a trial of the serum. He discontinued everything in the line of treatment, such as hypophosphites, cod liver oil, etc., and took the serum, with the result that by Christmas all signs of active disease in the left lung had disappeared. Resonance had returned in a very gratifying manner, and there were left evidences of only a small cavity with some surrounding induration. His weight had improved beyond any previous weight he had ever attained, and he considered himself so well that in the middle of January he suddenly discontinued treatment, before I believed he was perfectly cured. The result is that two weeks ago, he had hemoptysis. I have not seen him since, and know not the source of the hemoptysis.

(To be continued.)

SELECTIONS.

Response to the Toast "The Babies."—Dr. I. N. Love of St. Louis, at a banquet given at St. Louis to the General Passenger Agents of the Southern and Western Railways, April 30, said: "We fathers too often desert the field and leave our wives alone to look after our babies, and this is wrong. The father is more closely related to the baby than he realizes, is indeed *particeps criminis*, in other words, equally responsible with the mother, but in the majority of instances we shirk our duty and throw the burden upon the shoulders of the one already weary in well doing.

There is no power that could make the mother waver in her performance of duty to her child. It is not always so with the father, but it should be. No more serious question confronts us than "the babies," and there is no question that should command a greater part of our best thought. We should remember that the baby is shot into this cold and cruel world without having been consulted either as to whether he wanted to come, what particular place he would like, what special kind of environment, or what individual equipment he would desire. Indeed, he is not consulted at all as to the coming, but oftentimes after arriving here he is consulted more than he should be as to his own proper management. The preceding proposition being true, surely the physical authors of the babies' being should appreciate the fearful responsibility they have assumed. They should determine to make it the business of their lives to develop their child in the right direction, physically, mentally and morally.

In the early part of the baby's existence he is largely a "vegetable"; he then becomes "animal," and later the "spiritual" begins to develop. The fullest opportunity should be furnished for the most complete vegetable and animal development possible, and to this end the rules of hygiene and health are of vital importance. The baby that is properly fed, and the mother usually takes care of this part of it, thrives, but the father should remember that during this period he himself should assume more than his usual share of the burdens. He should realize that the, to him, sweetest object on earth, the mother of his child, has a dual nature; that she has intellectual and fruit-bearing functions; that during the period when she is engaged as a fruit-bearer and doing her duty to her child, she should be relieved of the mental burdens that otherwise might fall to her, and receive more petting, fondling, coddling than usually falls to her lot. Fathers are too often so completely absorbed in money getting that they neglect to get acquainted with their babies. It has been said that it is a wise child that knows its own father, but I think indeed it is a wise father that knows his own baby and continues to know him from the time that he comes into the world until either the one or the other leaves it.

How few fathers cultivate the right kind of friendship between their children and themselves? Let us really make our babies feel and know that we are their best friend, next to their mother, on earth, and if we make them believe this we will have in our children our best friends. Let us treat our

baby friend the same as any other friend, respectfully, considerately, courteously, tenderly, generously, and when principles of right are involved, firmly, stubbornly even, and bend them in the right direction, and bend them early. Let us help the mother realize that all the coercion of a physical nature ever needed with a baby is before it is two years of age. The most important lesson a baby can learn is obedience. A puppy dog five days old can be taught to obey through physical punishment, and a baby need not be very old to be taught in the same way. Severity is never necessary, but a gentle firmness, a consistent stubbornness upon the part of the parent to secure absolute obedience as a regular habit of life, is essential.

We should teach our baby, first of all by example, to be just; to be kind; to be honest; to be sincere; to be polite; to be considerate of others; to be truthful. We should teach him, too, that reciprocity, the new golden rule, "Be good to all who are good to you," is essential to salvation in this life. We can early saturate the child with the full knowledge, a complete grasp of the meaning of the word reciprocity. Teach him that it isn't honest, that it isn't manly to accept favors from others selfishly and not reciprocate them to the fullest. With this thought in mind the child will feel and know that the kindness, the fostering care given him by his father, must be returned, and it will be returned with interest. The father who neglects his child is putting a mortgage upon the latter years of his own life and that of his child, and frequently foreclosure will come when least expected, and when he is least prepared to meet the burden involved.

Let us prize more highly the good opinion of our child and its mother than that of any other creature this side of heaven. Yes, gentlemen, let us feel that it is more dishonorable to neglect the coupons that have come to us from our matrimonial bonds than to neglect any business obligation on earth. I admire the man highly who has the courage to face the wide, wide world with the thought that he proposes to capture everything in sight within the limits of right, even though misunderstood, condemned, disliked, and yet who, when he faces his family, his babies, faces those who know that he is the dearest, best, most faithful, just and generous creature underneath the stars. Business pursuits and professional duties become seriously absorbing at times and prompts us to neglect the loved ones near us in a manner that we little dream of. We must determine, then, we big babies, to go hand in hand with our little ones all along the valley, up the hill and down the hill again, and as we make the journey, if we do our share we will be cheered and comforted when we approach the setting sun. Then here's to us all, babies as we are. Yes, we come into this world puling, puking infants, naked and bare; we go through the world puling, puking infants, each with his own share of sorrow, trouble and care. We go out of it puling, whimpering, helpless infants, faint, feeble, tottering, God in His infinite, omnipotent wisdom only know where, but all along the road if we are thoroughbreds here, we will be thoroughbreds there!

A Climacterium in Males.—In many males, there is manifestly a physiologico-critical period about the beginning of their fifth decade. This change of life is one primarily associated with nutrition. The digestive and assimilative functions begin to slow down between 40 and 50 years of age, and the organism as a whole, undergoes a readjustment. If the digestion remain active while assimilation becomes less perfect, an increase of weight, due to accumulation of fat, takes place. If, on the other hand, digestion is the first to fail, symptoms of dyspepsia, with associated loss of flesh, characterize the period of transition. It is in athletic individuals of active muscular habit that the manifestations are most marked. A time arrives when lessened nutrition renders it impossible to maintain the normal activity of the muscular system. The eliminatory organs perform their function less perfectly, and the processes of disassimilation are hindered. The accumulation of the products of metabolic tissue change in the system, reduces the vitality of the subject and indisposes him to the routine amount of exercise. If the subject fail to grasp the significance of these sensations he renders himself liable to various functional disturbances which may culminate in organic disease of the organ or organs most exposed to the strain. Even if he yield to the pressure put upon him, it takes some time for the muscular and vascular systems to tone down to the reduced standard of vitality, and during the period of adjustment he is apt to suffer from a variety of more or less distressing feelings; which not infrequently determine mental depression. The change is not unlike that holiday spent in active physical exercise. There is the same want of harmony between nutrition and muscular exertion, but, in the waning adult, there is, of course, the factor of increasing arterial rigidity and general loss of tone on the part of the tissues. The so-called "critical period" is only critical in so far as the readjustment of the organism to changing conditions is interfered with. Those who have always led a sedentary life are less subject to these disturbances than the more robust and actively disposed. Once the harmony of the functions has been restored the individual resumes his normal existence, though on a lower scale, and he ceases to be liable to the visceral engorgements which are apt to resort from "retrogressive irregularity."—*Medical Press and Circular.*

PRACTICAL NOTES.

Chambellan's Rhino-pharyngeal Speculum can be managed with one hand, as the mirror is adjusted by a screw turned by the thumb without effort, leaving the other hand free.—*Bull. de d'Acad. de Méd.*, April 26.

Soothing Pomade For Congestive Alopecia With Cephalalgia.—(Leistikow.) Tinct. cantharides, 3 grams; chloral hydrate, 2 grams; lanolin, 5 grams; vaselin, cherry-laurel water and lime water, āā 10 grams. For external use.—*Semaine Méd*, May 4.

Physiologic Inferiority of the Tissues.—Tuffier considers movable kidney, dilatation of the stomach, enteroptosis, varicocele, etc., evidences of a congenital inferior vitality of the tissues, which requires medical and especially hygienic treatment, with surgery the last resort.—*Progrès Méd.*, April 30.

Ether Spray For Hypertrophied Spleen has proved extremely efficacious in relieving the respiration, the congestion of the organ and the pain, in twelve new observations of malarial hypertrophied spleen. The left half of the abdomen was sprayed twice a day with 25 to 30 grams ether, and in about a month the spleen was reduced to normal size.—*Semaine Méd.*, May 4.

Gastrorrhagia in Chlorotics cured by immobilization of the stomach is reported by Cipriani; three cases. After the failure of other measures the hematemesis was promptly arrested by a compressing bandage applied around the body over the stomach, combined with rectal alimentation, nothing allowed to pass the lips. The extreme thirst was met with injections of salt solution and the hunger by a subcutaneous injection of cocain which produced complete anorexia.—*Semaine Méd.*, April 27.

Artificial Serum in Epilepsy is advocated by M. de Fleury, who ascribes the etiology in many cases to auto-intoxication, which he combats with appropriate diet and lavage of the stomach and bowels, treating the circulatory apparatus by cardiac medication and artificial serum, possibly venesection. The injections of serum augment remarkably the effect of the bromid which he combines with them while increasing the diuresis, raising the arterial tension and maintaining the integrity of the intellectual functions, etc.—*Gaz. Méd. de Liège*, May 5.

Precision in Fluoroscopy.—A foreign body can be located much more accurately if the spot where it is apparently located is marked on the skin on the side toward the screen and also on the side toward the tube. Professor Angerer uses for this purpose a metal ring mounted on a handle, on pressing a button in the handle a colored pencil protrudes at the exact center of the ring and marks the spot. Changing the position of the tube and marking the spots again, shows the precise location of the foreign body. If the marks are closer together on one side than the other the body is nearer the surface on that side. Its position in regard to each surface can be found exactly by the formulæ: A (distance between the marks on one side) $\div$ A + B (distance between the marks on the other side), and B $\div$ A + B.—*Cbl. f. Chir.*, May 7.

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SATURDAY, JUNE 4, 1898.

THE DEADLY CAMP FEVER AND ITS PREVENTION.

During the past two months we have heard much of the danger to which our troops will be exposed from yellow fever in their expected invasion of Cuba, but nothing has been said of the future possibilities of a disease which during our Civil War affected every newly raised regiment soon after it went into camp. Typhoid fever was the camp fever of the Civil War. In the year 1861-62 it struck down 78.62 and killed 19.55 out of every thousand white men serving in the Army. It was a deadly disease under the conditions then existing in the field, for of every hundred cases 35.90 proved fatal among the white troops and no less than 55.69 among the colored men. It was not a disease of certain months or certain seasons, for, as shown by Dr. SMART in a diagram facing page 20 of the third part of the medical volume of the History of the War, the highest crests of its several waves of prevalence and fatality corresponded with a period about two months after each of the calls made by the President for the raising of new levies. Again the President of the United States is issuing his proclamations for troops; again new regiments are being formed and concentrated in camps of organization and instruction, and already from these camps comes the newsgatherer's information that everybody is well with the exception of one or two men who are in the hospital under treatment for typhoid fever. We know more about this fever now than we did then. We know that it is mainly propagated by the water supply; and in looking back we can see how it came about that the camps of both the Union and Confederate Armies were ravaged by typhoid fever. A single regiment in an isolated camp may be able to preserve the purity of its water supply, but when twenty or thirty thousand men are camped in the same locality it is a difficult matter to prevent the drainage and filth of one regiment or brigade from contaminating the water-supplies of other parts of the command. Strict sanitary rules should be made and enforced concerning the use of the sinks that there may be no surface deposits to be washed by the next rainfall into streams used as drinking supplies. This is very well as a general sanitary measure against other diseases as well as against those that are water-borne; but there are special methods of preventing the spread of typhoid fever among the susceptible young men of the new regiments. There are special methods of purifying the water from this dangerous infection but each of the methods requires the expenditure of money for its installation and the exercise of much care to obtain satisfactory results. The Subsistence Department provides the soldier with hard-bread, bacon, coffee and many other articles constituting his field ration and each of these costs money; but the soldier's right to wholesome articles of diet has never been questioned. Should his right to be furnished daily with a ration of wholesome water be questioned? Water is more urgently required in the animal economy than food; its deprivation is expressed by symptoms of greater intensity and its frequent impurity is liable to cause disability and death. The troops in the field should be protected against this. The history of the volunteers called out by President MCKINLEY should show no such high crested waves of mortality from typhoid fever as that of the volunteers called out by President LINCOLN. Expense should not be considered when the well-being of the fighting men is concerned. It will be more than covered by the money hereafter saved in appropriations for pensions for disabled soldiers and dependent relatives. The soldier should be deemed entitled to a ration of water and the subsistence or some other department should be held responsible for its issue and its purity. We believe something of the kind will be done as an appreciation of the importance of pure water has of late been growing rapidly in the public mind. At our military posts, in the time of small economies "before the War," using this phrase in its application to current events, our medical officers were accustomed to recommend the boiling of their doubtful or suspicious water-supplies; but other methods of treatment giving pure and palatable results are available if the price be paid. Investigations have been completed, under the direction of the Surgeon-General in the laboratories of the Army Medical School, into the efficiency of certain suggested methods of purification which will, we hope, result in giving pure water to the troops and in lessening the death roll from typhoid fever.

THE CIGARETTE EVIL IN ITS MILITARY ASPECT.

A newspaper statement that in the medical examination of volunteers to meet the President's call to arms, a very large proportion, it is said as much as 90 per cent., of habitual cigarette users were rejected, has brought out considerable comment and some attempts at refutation of the charge against the popular indulgence. Even prior to the outbreak of hostilities, however, the question of the sanitary dangers of cigarettes was a living one, and it is not long since that an extended symposium, so to speak, upon the subject was published in one of the New York professional publications. In that the general consensus of opinion appeared to be that the maleficent effects of the habit have been very largely exaggerated before the public, and that the evil, if it be such to any extent, was not by any means deserving of all the condemnation it had received. If, however, the army examiners' experience is truly stated, it can not be denied that there is in it an element of national weakness that deserves the most thorough consideration. If 90 per cent. of cigarette smokers are unfit for military service according to the reasonably strict standard of army recruiting officers and examining surgeons, any extensive generalization of the habit is a matter to be most profoundly deplored.

There is before us another item bearing on this subject that emphasizes the danger, if such it be, of the use of cigarettes. It is said that the increasing mortality in the French army, which is stated to be steadily on the increase, is largely due to pulmonary affections that are themselves favored by the general habit of cigarette smoking. Other presumable causes are not more active than they were a few years ago, but this one evil seems to be constantly gaining ground and is therefore held as mainly responsible for the increased mortality from lung disorders in the French army.

Allowing full value to the possible inaccuracy of newspaper statements there is some occasion for serious thought in these items. Where there is so much smoke, to use an old saw, there must be some fire; the ever resilient popular belief in the dangers of cigarette smoking must have some foundation. It is certainly not altogether due to fanatical reformers to whom every form of stimulant or narcotic is an evil to be fought, for it has a much wider advocacy than can be found in that limited coterie. For a while it was maintained by some that the adulterations of the cigarette were the source of danger, but this has been practically given up as not supported by the facts—the average cigarette tobacco is no worse, if no better, than that indulged in in other ways. The peril seems to be in the facility the practice affords for unlimited indulgence, and perhaps it may be added, in the very common habit of cigarette smokers of inhaling the smoke, thus enlarging the area of absorption, facilitating the narcotization and very possibly also producing deleterious local action in the bronchi and lung tissue that will, under favoring conditions, afford a more ready point of least resistance to the action of morbid germs. The very mildness of the grade of tobacco used is itself an aggravation of the danger, as has been pointed out by some of those who have discussed the subject, since it tempts to and makes more easy the pernicious practice of smoke inhalation. That this is a pernicious practice hardly requires argument, since it is plain enough that the larger the absorbent surface the more prompt and decided will be the narcotic action, and the combined effect of this with the more constant or frequent usage of tobacco that the cigarette habit favors, can not fail to be injurious to the nervous system whatever the grade of the tobacco or whatever individuals may say to the contrary. There is here a field for psychologic studies in our hospitals and laboratories and, from what has already been done in this direction, there is little doubt but that such researches will confirm the unfavorable opinion so commonly extant in regard to this habit of cigarette smoking as opposed to other forms of tobacco usage. The direct mechanical effect of smoke-inhalation in producing a pneumokoniosis or tabacosis is also worthy of consideration; it is possible that this has a direct weakening effect upon the lung tissue, reducing its power of resistance to germs and thus accounting for the alleged increase of mortality from pulmonary disorders in the French army.

Taking all the facts and all the possibilities together, it would appear that in the extension of the habit of cigarette smoking, with its consequent tendency to excess in tobacco narcotization, we have an element of danger to the community the greater because of its increase among the young and immature. The practice was originally a Spanish one, and it suggests a query whether the misfortunes of the Spanish nation may not be due in part to a race degeneracy thus produced. If so, it will be well for us and other nations to take warning from their example. In these days also, when wars are still in fashion, whatever can diminish the military strength of a people is a national calamity.

UNFIT FOR MILITARY SERVICE.

Since the closing days of the month of April the energies of a large number of medical men have been devoted to weeding out from the candidates for military glory, those who from any cause seemed likely to break down under the exigencies of an active campaign. The responsibility for much of the delay which has occurred in the mustering in of companies and regiments, has been placed upon these officers who have been charged with unnecessary strictness in excluding men for trifling defects. The Army requirements, as published in a recent recruiting circular, are that the limits of age should be eighteen and thirty-five years; the height for all arms of the service not less than 5 feet 4 inches, with a maximum limit of 5

feet 10 inches for the cavalry; the weight for infantry and artillery from 120 to 190 pounds, and for cavalry not to exceed 165 pounds. No minimum weight is prescribed for the last mentioned arm, but the chest measurement is required to be satisfactory. From 5 feet 4 to 5 feet 7 inches the measurement at expiration should be 32 to 33 inches, with 2 inches of mobility; from 5 feet 8 to 5 feet 11 inches, 33 to 34¼ inches, with 2½ inches of mobility, and men of 6 feet and over, about 35 inches, with 3 inches of mobility. These are not unusual requirements. Moreover, examining boards were authorized to accept men otherwise eligible who did not conform exactly to the figures given in the circular. Nevertheless it appears that so many men, including some of local repute as athletes, have been rejected as unfit, that the daily papers have taken note of the subject and assumed that the proportion of rejections was as unusual as it was unexpected. They endeavor to explain it by suggesting a decadence in the physique of American youths, owing to the prevalence of the cigarette habit, or by holding the bicycle responsible for heart strain, and its low handle bar for round shoulders and deficient chest measurement. But the percentage of rejections, when officially published, will probably be found to be much smaller than the newspaper articles would lead us to expect. For several years past about 15,000 candidates for enlistment have been examined annually in keeping our small Army up to its peace strength of 25,000 men, and nearly one-half of these candidates have been rejected as unfit for military service. It is hardly to be supposed that men obviously unfit would have presented themselves for examination, yet one-half of those who evidently considered themselves able to do military duty were not so considered by the medical and recruiting officers. In time of war we should expect the percentage of rejections to be increased because in view of the privations, exposures and fatigues incidental to field service in actual war, the minimum of physical qualifications should be raised rather than lowered, chiefly because the lowering of the age limit from twenty-one to eighteen years permits many to come up for rejection on account of defective physique, whose age in time of peace would have barred them from consideration. We are confident however, no matter what the percentage may be, that the medical men engaged in this important work have done their duty faithfully and well in the interests of present efficiency and the protection of the pension rolls of the future, from cases of disability really due to causes existing prior to enlistment.

THE SYNOVIAL MEMBRANES.

A recent article concerning researches in the etiology of articular rheumatism, recalls those lately carried on by Vienna investigators. Their work was directed not only toward discovery of the causative factor of rheumatism, but to determine why the joint forms a *locus minoris resistentiæ*.

The histologic studies of HOFBAUER led him to the conclusion that the low resisting power was due to the structure of the synovial membrane. Not only is it very vascular in all its layers, but its vessels passing close to the joint surface, from which they are separated by a thin layer of tissue, bend on themselves and pursue a tortuous course directly under, and parallel to, the surface of the joint. Some authors assert that the capillaries extend free into the joint cavity, covered only by synovial cells. He failed to confirm the findings of BUDAY, viz., that the endothelial cells lining the capillaries protrude into the lumen; that the more swollen these cells and the less firm their union, the more uneven the inner wall of the capillary, thus forming little depressions between the cells which render especially favorable the lodgment of floating bacteria. BUDAY believed that joint metastasis occurs only by embolism, with suppuration, necrosis and breaking down into the joint.

HOFBAUER holds the opinion, based on his histologic investigations, that the rich vascularity of the synovial membrane and the arrangement of the capillaries account for the frequency of joint lesions in blood infections and intoxications. In the former the lesion is due to embolism, or the direct passage from capillaries into the joint. That this is possible, he (as have also others) has been able to verify by experiments on animals. The arthritis of gout, as well as the joint swellings sometimes following the use of antitoxin, illustrates the affections of blood intoxications.

The histologic researches of HOFBAUER have been especially supportive to the bacteriologic investigations of CHVOSTEK. The latter has resorted to similar experiments on animals to determine the permeability of the synovial membrane, and he found microbes in the joint sixteen hours after injection of the animal with the same. On the other hand, his bacteriologic examinations of joint effusions, and microscopic examinations of synovial membranes, have proved negative, as has also the blood of rheumatic patients. His negative results are confirmed by other authors, some of whom even state that a positive finding speaks against rheumatism. CHVOSTEK, therefore, assumes that, in view of the easy permeability of the synovial membrane and the failure of finding any microbes in the effusion, membrane or blood of rheumatic patients, the joint changes are due to toxic substances which would pass as easily as would the microbes. He does not deny that the toxins are produced by germs, but asserts that they are not demonstrable in joints or blood.

SINGER believes rheumatism to be a variety of pyemia, citing a series of cases with examinations of joint contents with positive bacteriologic results, as well as positive findings of blood in 15 per cent. of the

cases. He lays especial stress upon the erythema multiforme occurring in rheumatism, comparing it with the eruption of pyemia, in which he has found staphylo- and streptococci. He regards the erythema as a skin localization of circulating microbes (the cases of purely nervous form being excepted), and maintained that the researches of HOFBAUER are equally supportive of his findings as of those of CHVOSTEK, claiming that the presence of microbes in joints is not necessarily demonstrable, as they may be few in number, or remain as sediment in the joint.

It is evident that the methods of one or the other of these investigators have been defective, as their findings stand in striking contrast, and such decided differences in results could hardly be referred to defective diagnosis by SINGER. Both concur in the opinion that the blood acts as the transmitting medium for the cause of the local change. With this premise one would expect the blood would give positive results at some stage of the disease. This many others beside CHVOSTEK have failed to find, while in 40 per cent. of the cases of pyemia where the blood has been examined by various investigators, microbes have been found.

No less interesting than the discovery of the indisputable cause, would be the establishment of the identity of the same in the various clinical manifestations now attributed to this undetermined factor of rheumatism. The endocarditis, the chorea, the pleuritis and the pericarditis that may occur singly or collectively, co-incidently, preceding or following an articular rheumatism, are daily experiences of clinicians.

The following case may serve as a sample of some of the various complications:

A boy 10 years of age was admitted to the hospital in June of last year. His history in brief was as follows: About six weeks before he was seized with pains in several joints, which became swollen and very sensitive on pressure or motion. A physician called at the time made the diagnosis of rheumatism. Under treatment acute symptoms subsided and the boy was around and playing after a few weeks. About this time his parents observed jerking movements of arms and legs, which gradually became more aggravated until entrance into the hospital.

Physical examination.—Child of average size for his age; nutrition fair; slight rachitic changes in skull and legs; all joints are freely movable, painless and free from effusion; articulation normal; choreic movements of arms and legs; lungs negative; heart on palpation shows apex in the fourth intercostal space and the width of one and one half fingers outside of the mammillary line; no tremor. Percussion: Upper border of dulness corresponds to lower border of third rib; left coincided with apex; right less clear note over lower part of sternum than upper but absolute dulness on left sternal border. Auscultation: Loud systolic murmur over apex, decreased in intensity toward base; second pulmonary tone accentuated. A few days later a presystolic murmur was also heard over apex. After an interval of several days auscultation gave a similar result to that found on entrance; liver and spleen dulness normal. Examination of sensibility showed right hemi-hyperesthesia, which afterward disappeared. Temperature varied from one to two degrees above normal; pulse 80 to 90, with no qualitative changes.

Diagnosis.—Acute endocarditis with mitral insufficiency, chorea; hemi-hyperesthesia regarded as hysterical. The diagnosis of endocarditis was based on the changeableness of the auscultation signs, no weight being attributed to the percussion findings because of patient being a child with high-standing diaphragm, placing apex in fourth interspace. From this circumstance it would normally lie outside of the mammillary line, though the case in point slightly exceeded the limit of this. After the patient's entrance into the hospital the choreic movements subsided, but did not disappear. Three to four weeks later they became more marked and the patient complained of pain in the right side and later of pain under the lower part of the sternum. Examination of chest showed on right side, posteriorly, absolute dulness eight fingers' breadth above the previously determined lung border; left side unchanged; heart dulness the same, with the addition of pericardial friction-rub, heard loudest along the sternum and over the base. Later examinations showed the characteristic increase in the heart's dulness accompanying a pericardial effusion. This was not to be clearly defined on right border because of its merging into dulness of pleuritic effusion. Aspiration gave a serous fluid. Present diagnosis, chorea, mitral insufficiency, pleuritis with effusion, pericarditis.

Traced from the first illness, that of articular rheumatism, we have successively developing endocarditis and chorea. The order in which these occurred must remain a matter of conjecture. Clinical experience shows that these three affections may alternate in any order, which circumstance would tend to confirm the identity of their etiology. The later development of inflammation of the pleura and pericardium showed these serous surfaces to have more resistance than the more susceptible synovial membrane.

It seems reasonable to assume that the etiologic factor had not been eliminated, nor had it ceased in its activity, as the clinical symptoms at no time entirely subsided.

A ROYAL ARMY MEDICAL CORPS.

For many years past the grievances of the medical officers in the British service have been of such a character as to enlist the sympathies of the medical profession. All the great medical schools have been in the habit of discouraging their students from entering into the open competition for service in the the Army Medical Staff. The standard of efficiency has thus been lowered, while more than 10 per cent. of the authorized positions have remained unfilled. As the Army, in consequence, has not enough of medical officers to meet the ordinary requirements of peace, the question of what would happen in the event of a serious war has been a subject of anxiety both to the medical profession and the War Office Authorities. A committee of the British Medical Association some time ago formulated the grievances of the medical staff and the demands of the profession. The medical officers of the army complained that while they had no longer that connection with individual regiments, which formerly gave them a recognized status and a social intimacy with their

combattant colleagues, they have been compensated by no substantive military rank, the relative rank given them with the cumbersome titles of surgeon-colonel, etc., having proved to be inadequate to raise their status above the level of a civilian serving with the army. The English papers of May 5, 1898, indicate that these unsatisfactory conditions will soon be remedied. At a banquet given at the Mansion House by the Lord Mayor to Sir SAMUEL WILKES, President of the Royal College of Physicians, Sir WILLIAM MACCORMAC, President of the Royal College of Surgeons, and the leading members of the medical profession, the Secretary for War, Lord LANSDOWNE, made a speech in which he frankly declared that the War Office had determined to treat the Army Medical Staff liberally and to remove the grounds for the complaints that had so long been ineffectually urged. He stated that the medical officers of the army will hereafter bear the military stamp. They will have the same titles, up to the rank of colonel, as other officers of the Army and will exercise command of their own corps, the Royal Army Medical Corps. It may therefore be confidently assumed, according to the *Times*, that at the next public competition there will be a marked improvement both in the number and quality of the candidates for the Army Medical Service.

The United States Army Medical Department has at the present time a difficult work before it in organizing and equipping its medical service and hospital corps, but fortunately it is not handicapped by any of the conditions which are now for the first time undergoing radical treatment in the British service. It makes its start in this war with Spain in full possession of that which has been the objective of the British medical staff for years, rank in the army and command over its own hospital corps men.

THAT ADVERTISING CIRCULAR.

We reproduce the following from *Printer's Ink* of May 25, which is self-explanatory. With this we close the subject.

TO RIGHT A WRONG.

"THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION,"
Published Weekly under Direction of
Board of Trustees.
61 Market Street.
CHICAGO, May 16, 1898.

Geo. P. Rowell Advertising Co:

Replying to your letter of May 14, I have to say that on examination of the blank sent to this office concerning the alleged agreement to publish the Ripan's Chemical Co.'s prepared medicine, I find that the blank was never in this office to the knowledge of any responsible person connected with it. The handwriting in the blank is not that of any person connected with this office. The typewriting does not conform to that used on the machines in this office. Furthermore, the blank is not signed. The alleged rate shows that it is put in as a monthly rate instead of a weekly rate, which does not conform to the business of this office. In addition I will say that we had rejected this advertisement because of the ruling of the trustees, and we could not have accepted it under any circumstances. As the publication of the name of this journal in a list of those accepting the advertisement, without authority, has been a pecuniary loss to the JOURNAL I trust that you will publish this letter in order that the wrong may be righted. I am, gentlemen, faithfully yours, JOHN B. HAMILTON.

THE JOURNAL SPECIAL TRAIN TO DENVER.

The JOURNAL SPECIAL TRAIN will leave the Union Depot, Adams and Canal Streets, Chicago, Saturday, June 4, at 11 P.M., via the Chicago, Burlington & Quincy Railroad, arriving in Denver Monday morning 7 A.M., in time for the meeting of the American Academy of Medicine, the American Medical Editors' Association and other medical organizations holding sessions on Monday.

Pay no attention to statements other than those announced in the JOURNAL. The reason for arranging for the stop-over on the return trip was owing to the fact that the Exposition at Omaha will be in much better condition then than now. Passengers from the East taking the JOURNAL SPECIAL at Chicago may have their stop-over arranged without extra cost.

The "Special" will run through. Tickets will be good for thirty days. The rate will be one fare and $2 for the round trip, the most favorable rate yet granted the ASSOCIATION.

There is but one JOURNAL SPECIAL train, and that is managed solely in the ASSOCIATION interests. Personal and not ASSOCIATION interests have promoted most of the other "specials." Stand by the regular JOURNAL train, Chicago to Denver via the *Burlington* route.

CORRESPONDENCE.

Second Attacks of Measles.

ALMA, MICH., May 17, 1898

To the Editor:—Some weeks ago, I saw in the JOURNAL a communication from some one setting forth, tentatively, the theory that a second-time case of measles will not communicate measles. Six weeks ago Effie G. was taken sick with measles the second time. In the same family is a child of four years who never had measles. She remained in the room with the sick girl nearly all the time, and did not take the disease. If this is the principle in these cases it should be known.

Yours, I. N. BRAINARD, M.D.

ASSOCIATION NEWS.

Executive or Business Committee.—The first meeting of the Executive Committee of the AMERICAN MEDICAL ASSOCIATION will be held in the club room of the Brown Palace Hotel, Denver, Colo., Monday afternoon, June 6, at 5 o'clock. Subsequent meetings of the Committee will be held at the same time and place each afternoon during the meeting of the ASSOCIATION, unless otherwise ordered by the Committee. It is essential for the successful conduct of the ASSOCIATION that all the members attend the meetings of the Committee. L. DUNCAN BULKLEY, M.D., Secretary.

Announcement.—The following arrangements have been made for the Denver meeting of the AMERICAN MEDICAL ASSOCIATION:

Section Dinners will be given June 7, at 7:30 P.M., and social entertainments will be given on other evenings during the week.

Ladies' headquarters will be at Unity Church, where they will be received by the wives of physicians of Denver. Arrangements have been effected for their entertainment during their visit, and committees will escort the visiting ladies to the various points of interest in Denver.

On Friday June 10, a complimentary excursion to Idaho Springs and around the loop will be given by the Colorado State Medical Society. At Idaho Springs, the ASSOCIATION will be entertained by the citizens.

On Saturday, a complimentary trip will be made to Colorado Springs under the auspices of the Committee of Arrangements. At Colorado Springs the ASSOCIATION will be entertained by the local physicians and citizens. Visits will be made to all points of interest in the vicinity. Arrangements will be made for trips to Pike's Peak and the celebrated mining camp of Cripple Creek at low rates of fare.

At a date to be determined, special trains for Glenwood Springs will leave Colorado Springs via The Denver and Rio Grande Railroad and the Colorado Midland Railroad. Tickets $5.00, good going via one railroad and returning the other, and for ten days from date of issue.

The trip to Glenwood is one of the most attractive in Colorado, giving excursionists a view of some of the finest scenery in the Rocky Mountains, including Pike's Peak, Ute Pass, the Valley of the Arkansas, Hagerman Pass, Canons of the Roaring Fork and Frying Pan, Canons of the Grand and Eagle Rivers, Tennessee Pass and the Royal Gorge of the Arkansas and passing through the cities of Pueblo, Leadville, Canon City and Florence.

Special Hotel rates will be given by the Hotel Colorado and other Hotels of Glenwood Springs. The springs, baths and swimming pool will be free to the ASSOCIATION.

Special cars will be hauled on the Colorado Springs train and the Glenwood Springs Special, only when handed to the railroads with their full capacity.

Railroad Rates.—The Western Passenger Association, Chicago, formally announces the following rates for the Denver Meeting of THE AMERICAN MEDICAL ASSOCIATION, June 7–10, 1898:

Rate.—One regular first-class normal tariff (not temporarily) fare, plus $2.00, for the round trip from Association territory to Denver, Colorado Springs and Pueblo, Colo., and return.

Dates of Sale.—Tickets to be sold from Eastern Committee territory, June 2, 4 and 5, and from Trans-Missouri territory, June 5 and 6, 1898.

Limits.—On going trip tickets to be good for continuous passage commencing on date of sale up to first Colorado common point en route; stop-over to be allowed on going trip at intermediate Colorado common points, but to arrive at destination not later than June 7, 1898. The return to be continuous passage beginning on date of execution by joint agent, with the provision that the return passage shall not commence earlier than June 12, nor later than July 6, 1898. Tickets may be executed for return at destination or either of the other Colorado common points en route. Purchaser to commence his continuous return journey from point of execution.

Diverse Routes.—For this occasion tickets may read west of the Missouri River, going one route and returning another via any regularly authorized route via which regular short line one way rates are properly applicable.

SOCIETY NEWS.

Meeting of the Medical Publishers.—The fifth annual meeting of the American Medical Publishers' Association will be held in the parlor of the Albany Hotel, Seventeenth and Stout Streets, Denver, Colo., June 6, at 2 o'clock P.M. The following program has been arranged: 1. Meeting of the executive committee. 2. Reading minutes of previous meeting. 3. Reading correspondence from absent members. 4. President's address. 5. Reports: *a*, executive committee; *b*, arrangement committee; *c*, committee on resolutions; *d*, committee on publication; *e*, treasurer; *f*, secretary. 6. Applications for membership. 7. Presentation of papers: "The Dignity of Advertising," by H. C. Smith, New Orleans; "Some Unique Features," by Henry Waldo Coe, Portland; "The Shadowy Ethics of Journalism," by T. O. Summers, St. Louis; "The Local Journal," by A. R. Axtell, Denver; "The Problems in Medical Journalism of today," by H. D. Reynolds, New York City; A paper by J. R. Clausen, Philadelphia; volunteer papers and subjects for discussion. 8. Resolutions introducing new business. 9. Miscellaneous business. 10. Election of officers. Adjournment. It is expected that at this meeting the question of admitting nostrum and lay-press advertisers to the columns of the medical press will be thoroughly ventilated and discussed. Some of the objects of this association are to protect against mutual enemies and impostors, and encourage a friendly feeling between publishers and editors; to teach and to be taught; to solve the problems which are continually confronting those engaged in medical journalism; to make the medical press of the country more worthy of a place in literature, and to make more uniform and consistent the business end of medical journalism. Editors, publishers and others are cordially invited to attend. William Warren Potter, M.D., President; Charles Wood Fassett, Secretary.

The Fifth District Branch of the New York State Medical Association held its fourteenth annual meeting in Brooklyn, N. Y., May 24. The President, Dr. N. W. Leighton, delivered an address on "The Physician and his Profession," which was ordered published. Sketches of deceased members by Drs. R. M. Wyckoff and John Shrady were also read. During the afternoon session there was a written discussion on the phases and treatment of gonorrhea, in which Drs. Robert W. Taylor, J. W. S. Gouley, William E. Beardsley, Lawrence Coffin, William McCollom, J. C. Bierwith, L. Grant Baldwin, George H. Mallett, Walter B. Chase, Fred. H. Wiggin, Robert Newman, N. L. North, Jr., A. Matthewson, L. A. W. Alleman and Thomas H. Manley were participants.

West Virginia State Medical Society.—The annual session of this Society was held in Martinsburg, May 18 20. Dr. J. N. Alley of Benwood presented a paper on "Cancer of the Tongue," Dr. R. W. Haglett of Wheeling one on "Sexual Perversion," and Mr. Munchen of Cincinnati an address on "Hypnotism," the first day, morning session. At the afternoon session Dr. Clyde S. Ford of Wheeling read a paper on "Fracture of the Patella," speaking of the "Treatment by Mediate Ligation" with a report of fifty cases. A paper on "Exophthalmic Goiter," by Dr. L. D. Wilson of Wheeling was then heard. The members of the association then discussed these papers. On succeeding days Dr. C. S. Hoffman of Keyser read the report of the Committee on New Remedies, and papers were read by Drs. S. L. Jepson, Clyde S. Ford and L. D. Wilson of Wheeling.

Washington State Medical Society.—The ninth annual meeting of the Washington State Medical Society was held in Seattle, May 10 and 11, and was in many ways the best meeting since the organization of the Society, especially in the character of the papers read and the interest taken in the discussions: The United States Marine-Hospital Service was officially represented by Passed Assistant Surgeon S. D. Brooks. The Oregon State Medical Society was represented by Wm. Jones, president, A. C. Smith and K. A. J. McKenzie, both ex-presidents, and Henry W. Coe, editor of *Medical Sentinel*. The officers elected for the coming year were: President, Henry W. Dewey of Tacoma; vice-president, J. W. Hickman, Tacoma; secretary, Chas. McCutcheon, Tacoma; treasurer, J. W. Bean, Ellensburg. The next meeting will be held in Tacoma on the second Tuesday in May, 1899. The Society took the preliminary steps toward the organization of a State medical library, and a board

of trustees was appointed to carry it forward. It will be operated in connection with the Seattle city library. This is the first public medical library to be organized in the Northwest and, so far as we know, the only one west of Denver.

PUBLIC HEALTH.

Yellow Fever in West Indies.—Dr. Anderson of Georgetown, British Guiana, has published a pamphlet narrating the results of an experience of thirty-four years in the American tropics. He was fortunate in having had a certain amount of preliminary drill as to yellow fever from able and experienced men before he had to treat his first cases, and he refers to the difficulties with which the inexperienced practitioner has to contend who is called upon to treat disease without any previous clinical knowledge of it. The author's remarks in this respect are not only applicable to yellow fever but to diseases of tropic and subtropic climates generally. The book contains but little on the pathology and bacteriology of yellow fever; it consists mainly of reminiscences of a clinical and therapeutic nature and of impressions derived from the author's practical acquaintance with that disease. In the first chapter the health conditions of the West Indies formerly and at the present time are briefly described and they furnish a striking testimony to the prophylactic results of progressive medical and sanitary work. The change is a very remarkable one, for formerly, owing to a disregard of obvious insanitary conditions and considerations of personal hygiene and defective medical knowledge, the mortality among British troops and Europeans generally was enormous, whereas under improved sanitation, improved habits of life, a clearer appreciation of the predisposing causes of disease, and better methods of treatment the death-rate has been steadily diminishing, until the West Indies may now be reckoned as among the most healthy of the British colonies, whither, as we know, tourists and persons in delicate health often nowadays proceed as a winter resort. Practically speaking, we may say that about the best thing to do in the event of an outbreak of yellow fever on shipboard is to put to sea at once and run toward the north. The author deals with the geographical distribution of the disease and its causes, reference being made incidentally to the bacteriologic observations of several writers, and to those of Sanarelli of Montevideo and Havelburg of Rio Janeiro in particular, regarding the existence of a specific organism as the essential cause of yellow fever. The susceptibility to attack is dealt with and it is pointed out that while natives and negroes have a relatively small susceptibility to yellow fever they are nevertheless occasionally attacked by it. The symptoms and course of the disease and the state of the urine in yellow fever are discussed; the observations regarding the latter point are valuable.

Legislation in Ohio Regarding Quack Medicines.—The *Cleveland Medical Journal* is righteously indignant over the opposition that has been, through mercenary means, raised against the "Bennett bill." This bill merely provides that "patent medicines" shall have their formula printed on their labels. There is nothing unreasonable about this, but the *Leader* sees fit to antagonize the bill as being "An Attack upon Business Men," just as if nostrum-makers were genuine merchants. So far as we can see, there is nothing in common between real business and the patent medicine business. The sawdust and gold brick business are more intimately related with the patent medicine "business." But to return to the *Journal*, which says, "It is impossible to lay aside the suspicion that the pressure which the patent medicine makers are known to be making on all the newspapers is the reason of the *Leader's* attitude. What other reason can there be? Its arguments are of a most surprising character. Absolutely the sole argument advanced against the proposed measure is that few patent medicines contain enough poison to be deleterious to health, and that 'nearly every physician's prescription contains one or more poisonous ingredients, and the compounds made from these prescriptions would be as deleterious to health as any patent medicine if taken in doses larger than are indicated by the directions.' Passing by the obvious fact that the last sentence entirely begs the question and destroys the argument, and also the fact of its general misrepresentation, one can but wonder if the writer of the above was simply fatuous or deliberately intended to deceive when he neglected to state that the physician's prescription is always on file at the drug store where it was filled, and hence the composition of the medicine made up therefrom is always readily ascertainable; when he further neglected to allow anything for the special training of the physician, taken for the purpose of learning how to use medicine intelligently, and further neglected to allow for the care of the physician under which the effect of the remedy is watched and the precautions taken to avoid ill consequences of over-use. If the opponents of the Bennett bill have only this style of 'argument' to urge against its passage, even the Ohio Legislature would be promptly compelled to put the law upon the statute books. Unfortunately a much more potent, persuading and insinuating 'argument' is at hand for use on both the newspapers of the State and the lawmakers themselves."

Vaccination and Smallpox.—The Council of the British Medical Association have published a tract and a leaflet; the latter being an abstract of the former, in answer to the anti-vaccination propagandism that is ever and again cropping out in England. The *British Medical Journal* for March 5, 1898, publishes both documents in full. Following is the text of the leaflet: "1. The mortality of smallpox is much less now than in pre-vaccination times. 2. The greatest diminution in the smallpox mortality is found in the early years of life, in which there is most vaccination. 3. In countries where there is much vaccination and re-vaccination relatively to the population, there is little smallpox. 4. In classes among which there is much vaccination and re-vaccination there is little smallpox. 5. In places where smallpox prevails it attacks a much greater proportion of the unvaccinated than of the vaccinated; especially where the vaccinations are comparatively recent. 6. In houses invaded by smallpox in the course of an outbreak not nearly so many of the vaccinated inmates are attacked as of the unvaccinated, in proportion to their numbers. 7. The fatality rate among persons attacked by smallpox is much greater, age for age, among the unvaccinated than among the vaccinated. 8. It can not be truthfully alleged that independently of vaccination, smallpox is a milder disease now than in former centuries. 9. The degree of protection conferred by vaccination corresponds to the thoroughness with which the operation has been performed, three or four marks being much better than two or one, and a large mark much better than a small one. 10. Sanitation can not account for the facts above set forth. 11. Thorough isolation of smallpox cases in hospitals is a useful auxiliary to vaccination; it is no substitute for it. 12. Vaccination is very safe. 13. Calf lymph is now available to boards of guardians, etc., for the vaccination of every child in this country" (England). These twelve statements are taken up seriatim in the tract and proved by statistics, etc.; the whole seems to be a very clear and succinct statement of the incontrovertible evidence for vaccination.

How Contagious Diseases are Disseminated.—To those who wonder how cases of contagious disease spread through a community, the following account, taken from the local paper of a town in western Massachusetts, may not prove uninteresting. On February 3, a young man who found occasional employment as a railroad news agent, was taken sick in the hotel where he lived. A physician was called, who reported that the disease was smallpox, and told him to keep the door of his room locked

and admit no one except a friend, a freight brakeman, who remained with him and took care of him. The manager of the hotel was present, knew what the diagnosis was, and is supposed to have understood the importance of isolation. Notwithstanding this, as the boy said, "everybody in the house dropped in to see me." Many of his newsboy chums called, and some of them spent a good deal of time with him, sitting socially on the bed. He was also visited by several young women acquaintances, who were employes in a shoe shop and who returned to their work. The newsboys returned also to their vocation. Two days after the physician who was first called saw the case, another physician was called, the diagnosis of smallpox was made and the Board of Health notified. Twenty-four hours later action was taken and a house on the outskirts of the town was secured for a pest-house, but no one in the town could be persuaded to furnish conveyance. Finally, a man living in a neighboring town, for the consideration of ten dollars, furnished a wagon, and the doctor and the brakeman who acted as nurse made the transfer. In the language of the reporter: "The equipage had the street all to itself. People were afraid to even look at it. One young woman in town who chanced to see it has since been in a miserable state of unstrung nerves, and is thoroughly convinced that she 'caught it.'" The brakeman has been quarantined in a room on the top floor of the hotel, and the hotel has been disinfected with sulphur and other disinfectants. Aside from this no quarantine has been established, and the hotel has continued doing business as if nothing had happened. The barber shop, bathing establishment and saloon connected with the hotel continue to do a thriving business. Many people, however, avoid the street in which the hotel stands, and small boys having occasion to pass the building have been observed to hold their noses and run past at full speed. All who were known to have been exposed have been vaccinated, and vaccination is being generally performed throughout the town. —*Boston Medical and Surgical Journal.*

NECROLOGY.

JOSEPH STEDMAN, M.D., Boston, died at Watkin's Glen, N.Y., May 17, aged 63 years. At the breaking out of the Civil War he enlisted for three months in the Sixth Massachusetts. When his time expired he re-enlisted, and returned to Medfield and raised a company, of which he was made captain. This company was in the Forty-second Massachusetts. During the war he was promoted to lieutenant-colonel, and after the capture of Colonel Burrill he was acting colonel.

LOTT SOUTHARD, M.D., Geneva, N. Y., 1852, died at his home in Newark, N. J., May 14, from diabetes. He was born in Basking Ridge, N. J. seventy-one years ago, was long identified with St. Barnabas Hospital as one of its surgeons, and at the time of his death was also a member of the Newark Board of Trade.

FREDERICK L. DIBBLE, M.D., New Haven, Conn., May 15, aged 68 years.——Thomas B. Dorsett, M.D., Manchester, Va., May 19, aged 62 years.——C. Earley, M.D., Ridgway, Pa., May 16, aged 74 years.——J. D. Kincaid, M.D., Catlettsburg, Ky., aged 89 years.——Jonathan Kneeland, M.D., South Onandaga, N. Y., May 21, aged 86 years.——Alexander Barton McWilliams, M.D., Washington, D. C., May 17.——Andrew Manning, M.D., Plainfield, N. J., May 19, aged 37 years——A. P. Ormsby, M.D., Kansas City, Mo., May 18.——Charles A. Shure, M.D., Port Deposit, Md., May 14, aged 57 years.——George W. Freeman, M.D., University of Pennsylvania, 1862, of Freemansburg, Pa., died May 16 of paralysis.

DEATHS ABROAD.—Dr. Anton Krassowski, the leading gynecologist of Russia, for many years professor of midwifery in the Military Medical Academy of St. Petersburg, author of an *Atlas zur Ovariotomie*, lecturer on midwifery and diseases of women, etc., aged 77 years.——Dr. Ludwig Schillbach, extraordinary professor of ophthalmic surgery in the University of Jena, aged 73 years——Dr. George Rosenbaum of Berlin, a neurologist, aged 40 years.

MISCELLANY.

High Degrees of Myopia, according to Knapp of New York, are more frequently seen in Europe than in America.

The Burning of the Hospital at St. Hyacinthe, near Quebec, May 16, has resulted in fourteen deaths, and this number was expected to increase. At date of writing three missing are supposed yet to be in the ruins.

Revised Mortality Statistics as applied to the population of the globe as a whole are stated by an exchange. Only 900 persons out of 1,000,000 die from old age, while 1200 succumb to gout, 18,400 to measles, 2700 to apoplexy, 7000 to erysipelas, 7500 to consumption, 48,000 to scarlet fever, 25,000 to whooping cough, 30,000 to typhoid and typhus, and 7000 to rheumatism. These averages might be considerably varied by careful autopsies, but perhaps fairly approach conclusiveness when the wide columns of figures are taken into account.

A New Vegetable Hypnotic, Casimiroa Edulis.—The study of the flora of Mexico, undertaken by the National Medical Institute, has already resulted in a new hypnotic, analgesic and antithermic, extracted from the seeds of the *casimiroa edulis*, a zanthoxylum of the rue family. Long experimentation and tests on several hundred persons have established its action, its freedom from secondary effects and determined the toxic dose. It does not seem to produce sleep, but rather to favor natural sleep, from which one wakes refreshed in four to six hours. It is especially adapted to insomnia from cerebral excitement or alcoholism. The northern cousin of the shrub, prickly ash, has long been known as the "toothache tree."

Titles.—The *New York Tribune*, in a humorous comment upon the question raised at the State convention at Little Rock, Ark., regarding the right of those other than teachers in colleges and universities to the title of "Professor." which was decided in the negative, pronounces the custom "an old voluntary system—not seriously taken even in America." We are consoled in the present instance by the omission of reference to our own calling, which is so wantonly accused of follies not quite grown into sins such as these. England, France and Germany have their share of allusions and apologies, but the insignificant "medical man" is not noticed, unless by a mere reference to our Anglo-Saxon brother who prefers "Esq." after his name rather than "Prof." before it. "On the whole," concludes the article, "we are lucky to be free of many of the questions about titles which complicate life in Europe so much. Certainly we are not as yet oppressed by them."

Recognition of the American National Red Cross.—It is understood that the President has directed the recognition, for any appropriate co-operative purposes of the American National Red Cross, Miss Clara Barton, president, as the civil central American Committee in correspondence with the International Committee for the relief of the wounded in war. So far as international correspondence with the Swiss Government in relation to the deliberations of the Geneva conferences is concerned, this government has uniformly recognized the American National Red Cross as the only civil body in the United States, which is regularly affiliated with the International Committee of Berne, for the purpose of carrying out the arrangements elaborated by the various conferences held at Geneva; and the representatives of the American National Red Cross at those conferences have uniformly attended with the sanction of the United State's Government. The army orders which we published in the last issue of the JOURNAL show that the military authorities have made all arrangements for the delivery of the neutralizing Red Cross brassard of the Geneva Convention, to those authorized to aid the medical department in its service in the field.

Records of Sick and Wounded in time of War.—The Act of Congress approved April 22, 1898, authorizing the organization of the volunteer army, requires all regimental and other medical officers serving with volunteer troops in the field or elsewhere, to keep a daily record of all soldiers reported sick or wounded as shown by the morning calls or reports, which records at the disbandment of the organizations will be filed in the record and pension division of the war department. To permit of this ultimate disposition of the medical records of the volunteers without interfering with the medical histories of men belonging to the regular army medical officers, who may have under their care patients belonging to both organizations will have to keep a separate set of records for each organization. The Surgeon-General of the army has therefore called upon the surgeons in charge of general hospitals to have separate registers of patients, and monthly reports of sick and wounded made for regular and for volunteer troops. Similar instructions have been issued to surgeons in charge of hospitals in the field in which regulars and volunteers are likely to be treated side by side. In time of peace monthly reports of sick and wounded are required to be forwarded in duplicate, one copy to the chief surgeon and the other direct to the Surgeon-General, but during the war only one copy is called for, to be forwarded from general hospitals direct to the Surgeon-General, and from field hospitals to the Surgeon-General through chief surgeons.

Field Supply Table of the Medical Department U. S. A.—The Surgeon-General has issued a Field Supply Table, approved by the Secretary of War, May 9, 1898, to meet existing army conditions. It provides for the use of regimental surgeons, two medicine chests, marked No. 1 and No. 2, containing a varied selection of drugs, many in the form of compressed tablets, instruments, dressings and books of reference such as Notter and Firth's "Hygiene," Osler's "Practice of Medicine," Zuckerkandl's "Operative Surgery," Stephenson's "Wounds in War" and Hare's "Therapeutics." Each private of the hospital corps is provided with a pouch containing aromatic spirit of ammonia, first-aid packets with pins, scissors, jack knife, wire gauze for splints, bandages and plaster, while each man on duty as orderly to a medical officer carries some additional articles such as a pocket case, rubber bandage, ligatures, chloroform and a hypodermic syringe. The medical officer is provided with a field case, field desk, lanterns, litters, etc. The field desk is furnished with stationery, blank forms and copies of the army regulations, manual for the medical department, drill regulations and Smart's "Handbook for the Hospital Corps." It is stated that renewals of supplies can be obtained by regimental surgeons from the surgeons in charge of a brigade or division hospital on a special requisition approved by the chief surgeon, and that no receipt is to be given for articles that may be expended. On the supply list the names of expendable articles are printed in roman type, those of unexpendable articles in italic. The table gives also the provision made for a brigade or division hospital including medicines, antiseptics and disinfectants, hospital stores, stationery, surgical instruments, appliances and dressings, furniture, bedding and clothing and miscellaneous articles, with surgical chests Nos. 1 and 2, a case containing an Arnold's sterilizer and a Berkefeld filter, a field operating case, a mess chest, a food chest, a commode chest and a set of folding field furniture.

Water-Supply at Tampa, Fla.—Articles have appeared in the daily press in relation to the unwholesomeness of the water-supplies furnished to the troops recently aggregated at points in the South. It is gratifying, therefore, to learn from an official source that at one of the points of concentration the supply is abundant and excellent. Dr. G. H. Altree, city health officer, Port Tampa City, certified in a circular letter dated May 9, 1898, that in his observation during five years no inhabitant of that city has suffered in any way from the use of the water-supply. During the years 1896 and 1897 the absolute number of deaths in the city was twenty-eight, eight of which resulted from accidents, leaving twenty due to all other causes. Not one of these deaths was occasioned by diarrhea or dysentery. An analysis of the city's drinking water by Prof. Geo. F. Payne, State Chemist, Atlanta, Ga., shows that although the water is somewhat hard owing to the presence of about seven grains of lime carbonate per gallon, it is perfectly free from organic matter. It yields no free ammonia and only .01 part of albuminoid ammonia per million parts of water. An analysis by Prof. A. A. Persons, State Agricultural Institute, Lake City, Fla., gave almost identical results.

Canned Salmon for Army Use.—The Subsistence Department of the Army has under consideration the advisability of issuing canned salmon in place of dried fish as an article of the soldier's ration and as a change from bacon when fresh beef is not available. Weight for weight, the canned salmon compares satisfactorily with fresh beef. Its calorific value is somewhat lower than that of beef on account of a smaller percentage of fat, but its muscle-forming material offsets this, particularly as a food in warm climates. A comparison of the analyses of salmon and sides of Texas beef, such as is usually issued at army stations, as given by Prof. W. O. Atwater in his "Clinical Composition of American Foods," Bulletin 36, U. S. Department of Agriculture, shows the average percentage of proteids in salmon, 19.5, and in beef, 14.6; fat, 7.5 and 16.0; refuse, 14.12 and 18.3, and water, 56.8 and 50.04. Of all canned goods salmon has the reputation of being that which has most frequently occasioned gastro-intestinal troubles; but this has little weight as an argument against its use when we consider the infrequency of such troubles and the immense amount of canned stuffs used annually by the population. There is no doubt the change will be accepted by the troops as giving an agreeable variety to the field ration.

The Mauser Rifle, the Spanish Arm.—It is believed that the Mauser rifle, as modified by the Spanish military authorities and used in the Cuban war by the royal troops, is a weapon better adapted for wounding than for killing, especially at short range. The bullet is one-third of an inch in caliber, conico-cylindric in shape, wrapped in five coverings, the outer of which is made of nickel-plated steel. With a charge of twenty-eight grams of smokeless powder the range is 2000 meters, and at 100 meters the bullet can pierce a meter of pine wood. Dr. J. S. Fernandez has described a case of Mauser gunshot wound in the *Cronica Medico Quirurgica*. The patient, aged 41 years, was wounded in the left temple, the bullet traversed the frontal lobe of the brain obliquely, and escaped just above the inner canthus of the left eye. Immediately on receiving the injury the man fell to the ground, but after recovering from the shock he did not complain of pain. The eyelids became swollen and pressed down on the eyes, excluding light. After eight days the swelling diminished and then it was noticed that the globe of the left eye had become much smaller and that the sight of that eye was lost. Neither pain nor suppuration had followed the injury and the sole lesion discernible was atrophy. The surgeon, in commenting upon the great velocity of the bullet, considers that in its passage through the tissues it cauterizes those with which it comes in contact; hence the primary hemorrhage is slight, but secondary hemorrhage frequently occurs, probably from slight sloughs from the cauterized walls of the injured blood vessels. The destructive power of the weapon is well shown by Dr. Antonio Canello y Peirole's case of a soldier who was cleaning the barrel of his loaded rifle. He had placed his left wrist on the muzzle and by some accident the rifle went off; the bullet entered the anterior surface of the wrist and passed out at the posterior surface at the carpo-metacarpal articulations. It blew away the car-

pal extremities of the radius and ulna; the whole of the os magnum, semilunar and unciform bones, and the carpal ends of all the metacarpal bones. On examining the wound with the finger it was found to contain a large number of spicula of bone, some loose and some only partly detached. The hemorrhage was slight. Under strict aseptic dressing the hand was saved, but not without much trouble. On the fourth and fifth days the patient complained of much pain, had a high temperature and was restless. On the tenth day there came a copious discharge of pus, and on the twelfth day the temperature was normal, the pus lessened and the patient made and uninterrupted recovery.

Footwear for Soldiers.—Wellington was ever deeply anxious that his men should be well shod. "What is the most essential thing for a soldier?" asked a member of the government of the Duke of Wellington. "A good pair of boots to begin with," replied the hero of Waterloo; "and in the next place a second pair of boots; and thirdly, a spare pair of soles." Alexander's victorious army reached India on sandals, and to this day a similar flimsy foot-protector is generally worn in eastern countries, but the ideal boot for a modern soldier should be impervious to moisture, stout and yet pliable, accurately shaped, and constructed of the most durable material. It should also be easily put on and taken off, should prevent the entrance of dust, sand or mud, and above all, favor the free play of each pedal articulation, while at the same time affording support to the muscles of the foot and ankle collectively. An ill-fitting, clumsily shaped boot is worse than none at all. Undue pressure or friction at any point quickly leads to corns and lameness. Formerly bunions and ingrowing toenails, due to pointed boots and shoes, were causes of a halting gait amongst the population generally, but of late years more attention has been given to the anatomic features of the foot, especially in growing children. Deformed feet are, however, still of frequent occurrence in the ranks, each case demanding special treatment; but it should be an invariable axiom with officers commanding companies that boots should be made to fit the feet and not vice versa. The following recipe for making boots both soft and waterproof was recommended by Edmund Parkes, and it still holds first place: "Take half a pound of shoemaker's dubbing, half a pint of linseed oil, half a pint of solution of India-rubber; melt together with care and rub in firmly." The India-rubber solution is highly inflammable, requiring attention during the melting process. The *Daily Mail* says, "It is always the same story, knavery and slackness clogging and strangling the best efforts of the British soldier. To save somebody a few pence on a boot you stand to lose a good rifle and bayonet in a decisive battle, and to break a good man's heart into the bargain. Is it worth it? But it is always happening; the history of the army is a string of such disgraces; and each time we arise and bawl 'Somebody ought to be hanged.' So says everybody. And nobody ever is hanged."

The Medical Staff at the Front.—It is difficult at the present time to keep track of the appointments to prominent positions in the Medical Department of the Army and of the movements or assignments of officers. So far as we have been able to note, Colonel Chas. R. Greenleaf, Assistant Surgeon-General, U. S. A., has been assigned to duty on the staff of General Miles as Chief Surgeon of the Army in the Field. During the past week he has been engaged in superintending the organization of the medical department of the troops at Chattanooga, Tenn. Major William H. Daly (Pittsburg, Pa.) has been assigned to special duty with Col. Greenleaf on the staff of the General Commanding. Lieut.-Col. H. Lippincott, U. S. A., has been placed as Chief Surgeon on the staff of General Merritt, commanding the expedition to the Philippine Islands. Major W. H. Corbusier, formerly on duty at Angel Island, Cal., is to accompany Col. Lippincott as Acting Medical Purveyor for the expedition; and Capt. W. O. Owen, Capt. Ed. R. Morris, Capt. Thomas U. Raymond, Lieut. Henry Page, all of the U. S. Army, and Acting Assistant Surgeon Geo. H. Richardson have also been directed to report to General Merritt. At Chickamauga, Ga., the 1st, 3d and 6th Army Corps are concentrated under Generals John R. Brooke, James F. Wade and Jas. H. Wilson, respectively. The Chief Surgeons of these three corps are Lieut.-Cols. Rush Huidekoper, John Van R. Hoff and Nicholas Senn, U. S. Vols. Major E. T. Comegys, U. S. A., has been ordered from Fort Sill, Oklahoma, to Chickamauga as Acting Medical Purveyor for the troops in camp. At Tampa, Fla., are concentrated the 5th Corps, General Wm. R. Shafter, the 7th Corps General Fitzhugh Lee, and the Cavalry Division, General Joseph Wheeler with Lieut.-Cols. Benjamin F. Pope and Louis M. Maus, U. S. Vols., and Major Valery Havard, U. S. A., as Chief Surgeons. Major L. W. Crampton and Capt. J. T. Clarke, U. S. A., have been sent to the 5th Corps. Acting Assistant Surgeons Fred J. Combe, Samuel W. Stiles and Wilfred Turnbull are serving with troops at Tampa, and Acting Assistant Surgeon F. A. E. Disney is serving at Fort Jefferson, Fla. Capt. W. P. Kendall has been ordered from Fort Bronson, Texas, to duty with the 9th Cavalry at Tampa. The 4th Corps is concentrated in the neighborhood of Mobile under General John J. Coppinger with Lieut.-Col. R. M. O'Reilly, U. S. Vols., as Chief Surgeon. Capt. C. B. Ewing, U. S. A., is on duty with the 5th U. S. Cavalry at New Orleans, La., and Acting Assistant Surgeons Maynard, J. Burgess and Arthur Jordan with troops at Mobile. The 2d Corps is in camp near Falls Church, Va., under the command of General Wm. M. Graham with Lieut.-Col. Alfred C. Girard as Chief Surgeon. No other assignment of medical staff officers has as yet been made to this Corps. Acting Assistant C. L. Anderson has been ordered from Hagerstown, Md., to Newport News, Va., for duty with Light Batteries of Pennsylvania artillery. The General Hospital at Key West, Fla., is under the command of Major Wm. R. Hall, U. S. A., who has with him Capt. H. A. Shaw, U. S. A., and Acting Assistant Surgeon E. A. de Lipcsey. The hospital at Fort Myer, Va., has Major W. B. Davis, U. S. A., as surgeon-in-charge, who has with him Acting Assistant Surgeon S. Melville Waterhouse. The general hospital at Atlanta, Ga., has Major Blair D. Taylor, U. S. A., as surgeon-in-charge, with Acting Assistant Surgeons Edgar A. Vander Veer and Edwin W. Patterson to assist him. The hospital at Fort Thomas, Ky., has Lieut.-Col. W. H. Gardner, U. S. A., as surgeon-in-charge, with Acting Assistant Surgeons David Baker and Burke L. Johnson to assist him. The hospital ship *Relief* is under the charge of Major George H. Torney, U. S. A., who has as assistants Acting Assistant Surgeons Llewellyn P. Williamson, Francis Metcalf, Randolph M. Myers and Joseph M. H. Henry. The appointment of certain immune Acting Assistant Surgeons has also been reported as Drs. Edward Bragg, M. G. Burgess and Rodger P. Ames, ordered to Mobile: W. E. Parker, H. W. Danforth, W. W. Calhoun, H. P. Jones, B. C. Leonard, G. M. De La Torre, W. P. Lawrence, Robert N. Pitts, and Hosea M. Delgado ordered to Tampa; F. S. Dabney, Jos. A. Tabor and A. R. Booth to New Orleans, La. Announcement has also been made of appointments as follows: To be chief surgeons with the rank of major, Clayton Parkhill of Denver, Colo.; Herbert W. Cardwell, Surgeon-General of Oregon; James H. Hyssell of Pomeroy, Ohio; Henry F. Hoyt of St. Paul, Minn.; Jefferson D. Griffith of the National Guard of Missouri; R. Emmet Giffen of New York; E. Boeckmann of Minnesota; Thomas S. Kimball of Marion, Ind.; Charles B. Nancrede of the University of Michigan, John M. G. Woodbury of New York, Lewis Schooler of Iowa; George Cook of Concord, N. H.; Jas. M. Jenne of Vermont; Leonard B. Almy of Connecticut, and Thomas Earle Evans of Woodward, Ala.

Lord Lansdowne on the British Medical Staff Corps.—At a banquet given in honor of eminent members of the medical profession of Great Britain, at the Mansion House, May 4, 1898, Lord Lansdowne, Secretary of War, is reported by the *Daily Chronicle* to have said: "There is no department in the public service which owes more to, and depends more upon, the members of your profession than the army. With every year that passes the engines of destruction are brought to a greater pitch of perfection. The wounds which could now be inflicted in a few seconds are more numerous and more serious than could have been inflicted in the same number of hours, not many years ago. Your skill and devotion are the correctives of our modern ruthlessness. I am using no idle phrase when I say that the army is proud that it contains a number of officers who belong to the medical profession, but who are none the less soldiers in the fullest sense of the word, wearing the Queen's uniform, holding Her Majesty's commission, ready to take their share or more than their share of the risk and hardship of warfare. We are determined that there shall be no failure, either in theory or practice, to treat them with the respect to which they are entitled. I insist upon this point, because I have observed with very keen regret that there has existed for some time past a certain estrangement between the army and the profession. This want of confidence has had for its result that we have been unable to attract to the service the number of candidates, and I am afraid I must add, the class of candidates, whom we should like to see serving in the medical staff. I will not attempt to diagnose the case. Some of the symptoms are puzzling and obscure. It is possible that in this case, as in many others in which reasonable people have agreed to differ, mistakes have been made on both sides. We on our side are determined that you shall have no cause of complaint of us. We have already shown by our action in dealing with several points to which you have called our attention that we were prepared to redress any injustice where you were able to satisfy us that injustice had been done. We are now about to deal, and to deal thoroughly, with a question with regard to which not only the medical staff of the army, but the medical profession generally, feels most strongly. I mean the rank and status of the Army Medical Staff. I sometimes hear it said: 'What does rank matter? Is not the title of doctor or surgeon by itself to be regarded as a title which any one should be proud to wear without further adjuncts?' I think the answer to that is, that in the army rank is the outward and visible sign of consideration and authority, and that although 'a man may be a man for all that,' it is necessary if he adopts the military profession, that he should have a military stamp to distinguish him and to secure him his proper place among his comrades. We have attempted several times to deal with this question of rank, as it affects the army doctors, and we have not been particularly successful. We have invented ingenious compromises which satisfied nobody, and titles of which some would, for cumbrousness and cacophony, be hard to beat. We propose to make a fresh start and to form out of the Army Medical Staff and the Medical Staff Corps a corps of officers bearing the same military titles as other officers of the army, always, of course, upon the clear understanding that those titles do not confer any right to command outside it. We propose to give them these titles up to the rank of colonel. I have been pressed not to stop there, but to go on to the rank of general officer; but there are reasons which seem to me conclusive against doing this. Our present policy is to restrict as closely as we can the number of officers bearing the title of general, and to insist that none shall rise to that rank unless he is required to fill one of a limited number of appointments, all of which will involve general command in the army and fitness on occasion arising to command troops in the field. No departmental officers will, under this system, be able to reach the rank of general officer, and it will be impossible for us to confer it upon members of the medical staff. Above the rank of colonel we propose to retain that of surgeon-general, with the rank and precedence of a general officer in the army. I have one thing to add. Her Majesty, upon whose good will toward your profession I need not dwell, has been pleased to signify her intention of bestowing upon the newly formed corps the title of Royal Army Medical Corps, a title which I am sure it will wear worthily. I trust that the members of the profession will recognize the sincerity with which we have endeavored to meet them, and that they on their side will help us, to the utmost of their abilty, to secure the services of the best of their students." Sir William MacCormac, responding to the toast of the Houses of Parliament, said he desired on behalf of his surgeon brethren to say how greatly they appreciated what had fallen from the Minister of War. In the face of great difficulties he had conceded all that the Medical Department and its friends in civil life had desired for it.

New Publication.—The *New Hampshire Sanitary Journal*, edited by Irving A. Watson, M.D., Concord, N. H., began publication with the May number. "The primary object of this journal is to advocate the public health interests of New Hampshire," it is also to be of practical value not only to health officers, but to all classes.

Tablet Erected to Two New Jersey Physicians.—At the annual meeting of the Camden County (N. J.) Medical Society, held at Blackwood, N. J., May 10, a large Tablet of brass was erected in the Camden County Almshouse, bearing the following inscription artistically engraved:

IN MEMORIAM.

This Tablet commemorates the services of
Dr. Joseph Wesley McCullough
and
Dr. Henry Ely Branin,
during the epidemic of Typhus Fever in the
Camden County Almshouse
from November 24th, 1880, to April 9th, 1881, when there occurred 103 cases with 33 deaths, including that of
Dr. McCullough.

The history of the Medical Profession of this Country affords no greater instance of unfaltering courage and heroic devotion to duty than was exhibited by these public servants, during this epidemic.

Erected by
The District Medical Society
Of the County of Camden, New Jersey,
May 10th, 1898.

The speech of presentation was made by Col. E. L. B. Godfrey, Assistant Surgeon-General of New Jersey, and that of acceptance by the Hon. Henry F. Wolfe, Director of the Board of Chosen Freeholders of Camden County. After the exercises, the Society was entertained at a banquet by the Board of Freeholders.

New Medical School's Faculty.—President Schurman of Cornell University has announced finally the faculty appointments in the new medical college in New York City, for which medical and scientific men all over the country have been anxiously looking for some weeks past. The list is as follows: Alexander Lambert, Professor of Clinical Medicine, Instructor in Physical Diagnosis; Charles E. Namack, Professor of Clinical Medicine; Francis W. Murray, Professor Clinical Surgery; George T. Elliot, Professor of Dermatology; Charles Stedman Bull, Professor of Ophthalmology; Allen McLane Hamilton, Professor of Mental Diseases; William F. Stone, Instructor of Anatomy, Assistant Demonstrator of Anatomy; George D. Hamlin, Instructor in Gynecology and Obstetrics; Louis W. Riggs, Ph.D., Instructor in Chemistry, Physics and Hygiene; Percival R. Bolton, Instructor in Surgery; Warren Coleman, Instructor in Clinical Medicine and Materia Medica; Lewis A. Connor, Instructor in Medicine; John Rogers, Instructor in Surgery, Assistant Demonstrator of Anatomy; Benjamin T.

Tilton, Instructor in Surgery; Edmund Pendleton Shelby, Instructor in Materia Medica Laboratory; Dever S. Byard, Instructor in Medicine; Edward L. Keyes, Assistant Demonstrator of Anatomy; Charles C. Barrows, Clinical Instructor in Gynecology; Bertram H. Buxton, Instructor in Bacteriology; J. E. Winters, Professor of Diseases of Children; Newton M. Schaffer, Professor of Orthopedic Surgery; Gorham Bacon, Professor of Otology; William Sickles, Assistant Professor of Chemistry and Physics; C. N. B. Camac, Instructor in Clinical Microscopy.—*N. Y. Commercial Advertiser.*

Hospitals.

THE FOURTH large city hospital in Berlin will be completed in 1903. Over thirteen million marks have been appropriated for it and it is expected to be a model in every respect, with 62 different buildings, mostly one story, and 650 beds, and all the modern appliances for hydro- and movement-therapeutics, etc. It is located in the extreme northern part of the city, with large grounds. The Koch Institute is to be incorporated with it in four separate buildings. As in all large establishments of the kind there will be two medical superintendents, one university graduate administration superintendent and four pharmacists, with an assistant physician to every fifty patients.—*Pharm. Ztg.*——By the will of the late William Keinath of Philadelphia $1500 was left for the erection of memorial beds at the German Hospital, to be known as the William Keinath, Sarah Keinath and Julia Keinath memorial beds.——The new Georgetown University Hospital, corner of Thirty-fifth and N Streets, Washington, D. C., which has been in course of erection since May, 1897, has practically been completed, with the exception of the interior furnishings. It has a frontage of sixty feet on N Street and a depth of fifty feet. It is four stories and basement in height and built of red brick. It is estimated that, completed, it will cost upward of $30,000.

Colleges.

THE SCHOOL OF MEDICINE of Georgetown University, Washington, D. C., held its forty-ninth annual commencement May 16, with a graduating class numbering seventeen.——The degree of M.D. was conferred on 103 students by the Medical College of New York University, May 18.——The thirty-ninth annual commencement of the Long Island College Hospital, Brooklyn, was held May 18, with a graduating class of seventy-two members.——The graduating class of Rush Medical College, Chicago, at the fifty-fifth annual commencement May 25, the first since the affiliation with the University of Chicago, numbered sixty-six.——The University College of Medicine, Richmond, Va., held its annual commencement May 26.——At the commencement of the Woman's Medical College of Philadelphia, held May 19, the degree of M.D. was conferred upon thirty-four students. Nine States and three foreign countries were represented among the list of graduates.——There were one hundred and thirteen graduated at the annual commencement of the Medico Chirurgical College, Philadelphia, May 21.——Jefferson Medical College, Philadelphia, is to have a new building on Tenth and Walnut Streets. The greater portion of the structure will be five stories, a portion six, and in the Italian renaissance style of architecture.

Societies.

The following recent meetings are noted:

Connecticut.—Connecticut Medical Society, 106th annual meeting. New Haven, May 25 and 26.

Illinois.—Chicago Medical Society, May 25 and June 1; Fox River Valley Medical Association, Elgin, May 24.

Iowa.—Iowa State Medical Society, Des Moines, May 18, 19 and 20.

Kentucky.—Southern Kentucky Medical Association, Hopkinsville, May 24 and 25.

Maryland.—Baltimore County Medical Association, Towson, May 19.

Missouri.—State Medical Society, Kansas City, May 24–26; St. Louis Medical Society of Missouri, May 28.

New York.—Monroe County Medical Society, Rochester, May 25; Washington County Medical Society, Argyle, May 17.

North Dakota.—State Medical Society, Jamestown, May 25 and 26.

Ohio.—Academy of Medicine, Mansfield, May 16; Belmont County Medical Society, Bellaire, May 27.

Pennsylvania.—State Medical Society, Lancaster, May 17–19; Venango County Medical Society, Franklin, May 24.

Tennessee.—West Tennessee Medical and Surgical Association, Jackson, May 19.

Cincinnati.

AT the regular meeting of the Academy of Medicine, May 16, a paper was presented by Dr. Gustave Zinke, on "Complicated and Difficult Labor." He reported three fatal cases with most complete and careful histories. Case 1. Puerperal eclampsia. Case 2, Post-partum hemorrhage complicated with nephritis. Case 3, Frontal presentation with prolapsed extremities, complicated with puerperal mania. Discussion was by Drs. Stanton, Kiely, Stewart, Fraid, McLean, Reamy, and the essayist. Dr. O. P. Holt reported a case of dilated and hypertrophied heart due to excessive use of tobacco: Male, 38, soapmaker, has been chewing tobacco for the last twenty-one years. During the last seven years he has used on the average three ounces of tobacco a day; smokes and drinks (beer) moderately; denies venereals and there are no evidences of syphilitic infection; has never had any rheumatism; no sudden strain thrown on his muscular system or upon the heart, nor has he ever been in any occupation necessitating undue exertion; has never indulged in athletics. He entered the Cincinnati Hospital over a month ago, complaining of his heart and stomach. Physical examination shows him to be well developed and fairly well nourished; eyes normal, ophthalmoscopic examination negative, no contraction of the field of vision; lungs normal; apex beat in the seventh intercostal space displaced as far outward as the anterior axillary line; beat forcible, diffuse, vibratory so as to somewhat resemble systolic retraction, but palpation determines that such is not the case; heart's action irregular as shown at apex and by pulse. Heart's action and pulse correspond; the area of superficial dulness resembling that of aortic incompetency; to the right it extends about an inch to the right of the sternum while the apex as said before is situated in the anterior axillary line; auscultation, no bruits, both sounds loud and ringing all over cardiac area, irregular action marked; liver and spleen not enlarged; uranalysis, negative. During his entire stay in the house no murmurs have been detected at any time. The urine has been examined every day and no albumin or sugar has been present at any time; average specific gravity, 1020; no casts on repeated microscopic examination. Blood, reds, 4,200,000; whites, 7500; hm., 78 per cent. Sphygmographic tracings show quick rise though short, and long slow descent with slight dicrotism at about the center. With the history and symptoms, Dr. Holt could not but look upon the case as one of tobacco heart.

ACADEMY OF MEDICINE, May 24.—Dr. J. A. Thompson, reported a case of sarcoma of the naso-pharynx, in a child 4 years of age, which had extended down behind the tonsil so as to become readily visible. This condition had been noted by the parents two weeks before the case came into the hands of a physician. The child had had several severe attacks of dyspnea, and was only saved from death by suffocation by the almost constant attendance of the family physician. A week from the time first seen, the tumor had reached a very large size, and for the relief expected by the removal of the mass more than for any hope of any permanent cure, an operation was advised. The growth was encapsulated and was in great part removed by the cold snare, the child being of course anesthetized. The gross specimen was exhibited and the microscopic report proved the clinical diagnosis that the tumor was a small round-celled sarcoma. Attention was also called in this connection to the extreme variability in malignancy of malignant growths of this region. He seven years ago removed a carcinoma from a patient, first union had resulted, and no recurrence had been

noted until a few weeks ago, when operation and microscopic examination had again proved a carcinoma. The regular paper of the evening, entitled "Lymphatic Leukemia with Report of a case of Pernicious Anemia," was read by Dr. G. A. Fackler. He called attention to the advances made in hematology during the past decade, laying especial stress upon the absolute certainty with which a diagnosis could be made by attention to this tissue alone regardless of clinical symptoms; that this was true as regards lymphatic leukemia, which clinically greatly resembled many cases of Hodgkin's disease; that in lymph atic leukemia, in which like in all forms of anemia, there was a varying diminution in the number of red cells, the diagnosis rested upon the high grade of permanent leucocytosis, usually the white corpuscles averaging 100,000 per cubic millimeter. This increase was mainly in the young cells, the so-called lymphocytes, which contributed in place of their usual 20 to 30 per cent., fully 90 per cent. of the entire number. The adult cells or polymorphonuclear neutrophiles while absolutely increased were relatively diminished, while the myelocytes so common in the splenomyelogenous leukemia, were extremely scanty in the variety under consideration. He recognized but two varieties of leukemia, the spleno myelogenous and the lymphatic, pure splenic and pure myelogenous being so rare as scarcely to warrant consideration. He wished to speak mainly of the clinical features of his subject, leaving out mention of etiology and pathology because of the chaos that reigned at present in these branches of the disease. In the spleno-myelogenous form the permanent leucocytosis was much greater as a rule than in any of the cases of the lymphatic, averaging over 400,000, while the principal point was the presence of abnormal white corpuscles known as myelocytes, occupying about 30 per cent. of the field. These two forms were also well separated clinically; the lymphatic was usually characterized by but slight enlargement of the spleen, and by general glandular enlargement; it usually occurred in the young and ran, as a rule, an acute course from six weeks to three months. The spleno-myelogenous, on the other hand, was recognized by the enormous enlargement of the spleen, almost filling the entire abdomen; the glands were not usually enlarged and the course was chronic. Where the blood showed a combinatian of the two types, the clinical symptoms also varied to meet these altered conditions. In pernicious anemia, the diagnosis was reached by the marked diminution of the red corpuscles, averaging 1,200,000; but the blood was subject to considerable variation, often great increase over this number without apparent cause; high color index, diminution in the number of white cells, irregularity in size and shape of the red cells and especially the presence of nucleated reds both normoblasts and megaloblasts. The latter when in excess of the former always indicated an unfavorable prognosis. The treatment usually directed was arsenic in gradually increasing doses of Fowler's solution; this was the only remedy as far as he knew that exerted any favorable influence on the disease, and in spite of this the cases usually ended fatally, though the fatal termination was often preceded by periods of improvement. The paper was discussed by Drs. Cleveland, Greiwe, Kramer, Schenck, Keily (the difference between chronic malaria and leukemia), Joseph Eichberg, H. M. Brown (the relation of nervous troubles, especially cord lesions, to pernicious anemia).

Society of Medical Research.—Regular meeting was held May 12, with presentation of specimens and discussion of: "Fibrous Pneumonia," by Drs. Whitacre and Eichberg. "Malignant Adenoma of the Naso-pharynx," "Tuberculosis of the Nasal Septum," by Dr. Freiberg, "Plugging of Cerebral Artery," Dr. Zenner. "Urine Crystals," Dr. Crane.

Health Department, April.—Measles, 52 cases, no deaths; diphtheria, 19 cases, 5 deaths; scarlet fever, 20 cases, no deaths; typhoid fever, 19 cases, 4 deaths; phthisis pulmonalis, 67 cases, 66 deaths; membranous croup, 8 cases, 1 death; pertussis, 76 cases, 18 deaths; varicella, 8 cases, no deaths; variola, 1 case, no deaths. Diseases causing greatest mortality: Pneumonia, 70; phthisis, 66; heart disease, 37; bronchitis, 32; meningitis, 22; whooping-cough, 18; apoplexy, 18; accidental, 18. From all causes there were 518 deaths for the month. Of the outdoor poor there were 475 treated, 1722 visits paid, and 13 deaths recorded.

Detroit.

Wayne County Medical Society.—The regular meeting, was held May 19. Judge Wm. L. Carpenter read a paper on "Malpractice," confining his address as closely as possible to the legal interpretation of the term malpractice. Dr. H. O. Walker led the discussion, treating the question from the standpoint of a physician. He gave it as his opinion that it was fair to presume that the surgeon or doctor who finds himself the defendant in a suit for malpractice is in every case the victim of greed, and unfortunately is often at the mercy of a stupid jury or a prejudiced judge. The Doctor stated that he knew a number of instances where the defendant was mulcted in heavy damages, though he was certainly not at fault in the treatment of the case in question. Thos. Hislop, attorney at law, read a paper on "Expert Testimony," followed on behalf of the medical profession by Dr. Leartus Connor. The Doctor stated that he had decided a number of years ago never again to appear as an expert witness, giving as his reason that the present methods in legal investigation are so unscientific and besides so revolting to the witness that they are to be condemned. He then went on to give a full description of what would, in his estimation, be a rational and scientific method of taking expert testimony, or rather of obtaining expert information in a given trial. As it is now, he declared, each lawyer is desirous, not of seeing justice done, but of "winning his case." His proposed system is to have the expert witness confer with the court and with the attorneys as an adviser, imparting such information as he has, by long and patient industry obtained, and which is not possessed by the legal profession nor by any ordinary witness. Attorney Alfred Lucking followed with an address on "Physicians' Privileges in Giving Testimony," the substance of which was that a physician can not be compelled to answer a question in giving testimony by which he would divulge any secret he may have obtained in a professional way, except in the case of any person who has waived his right to the provision.

At the regular meeting, May 26, S. E. Sanderson read a paper entitled, "Senile Gangrene or Renaud's Disease—Which?" The author reported a unique case of gangrene involving the toes and integument of the foot and lower two-thirds of the leg, in a lady 72 years of age, which resulted in recovery to health with loss of only four of the toes at the metatarso-phalangeal articulations. The case presented many features of an interesting character. The age of the patient, the heart trouble, which, though not organic, was serious enough to produce oppression, and the beginning atheroma of the arteries pointed to senile gangrene. But the history of the disease, beginning by syncope of the blood vessels of the leg and foot succeeded by cyanosis and gangrene, each following the other in rapid succession, and the presence of hemoglobinuria and the complete recovery, would make one incline to the diagnosis of Renaud's disease. E. B. Smith read a paper on "Surgical Tuberculosis of the Skin and Other External Organs." He stated that surgery of the skin narrowed itself down to such simple procedures as curettage, scraping or, at most, extirpation of the affected area, followed by skin grafting or flap operation. He referred to the tuberculous diseases of the eye, ear and nose, and gave their diagnostic features and chief methods of treatment. Tuberculous ulcer of the rectum and anus he described as of two kinds: 1. Those which occur in persons suffering from tuberculosis of the lungs and which contain no bacilli. 2. Those occurring as typic tubercular ulcerations primarily. The treatment for the latter is early extirpation. F. D. Summers exhibited the excised tubes of a lady aged 19 years, who had been infected with gonorrhea some time before operation. The doctor had removed the tubes, but the abdominal wound had never closed, and during her menstrual flow blood had escaped through the sinus. The Doctor reopened the wound and found that the stump of the tube had attached itself to the abdominal wall at the sinus. This was removed and the patient recovered. Incidentally at the second operation, the Doctor discovered and removed a large cyst of the broad ligament of the opposite side.

Health Report for the week ending May 28: Deaths 84;

under 5 years 31. Births, male 37, female 41; contagious diseases, diphtheria none. According to the Health Office this is the first time in twenty-five years that the city has been free from diphtheria. Scarlet fever 17; deaths from diphtheria 1; scarlet fever 1.

Consolidation of Bellevue and New York University.—The union of these institutions was announced by Chancellor MacCracken of New York University at the annual commencement of the Medical College of the University, May 18, when he read the following: The following action was unanimously adopted by the New York University Council on Monday, May 16, being presented by Mr. William A. Wheelock, on behalf of the committee preparing the same:

The Council of New York University regret to be obliged to announce that by reason of the failure of some of our professors of medicine since May 26, 1897, to observe the duties belonging to their relation to us under the University system, as interpreted by the Council, we were constrained to condition their continuance as permanent professors upon their acceptance of existing University rules and requirements. The six professors who belonged to the governing faculty have rejected this offer, and accordingly will cease at the end of this college year to be connected with New York University.

The Council have further maintained that they are beyond all possible question the rightful successors of the trustees of the Medical College Laboratory, and are the only proper persons to execute that trust. Yet they have offered without reserve to submit all questions involving our equity in the entire medical property used by us to arbitration. This offer has been rejected.

We here record as a subject of equal surprise and regret to this Council that a sister University some weeks ago began negotiations looking to the establishment of a new medical school in this city, with what was plainly a combination of professors at variance with their own University, and this without any consultation with this University and without the slight delay which would have enabled these professors decently to tender their resignations of their present professorships.

The Council further announces that the trustees of the Bellevue Hospital Medical College have today voted to complete the consolidation of that college with New York University. The strength of these two venerable foundations will henceforth be given to a single medical school under the title of "The University and the Bellevue Hospital Medical College." The alumni of the two schools, numbering nearly ten thousand graduates, will be placed on the rolls of the University. The two properties, together occupying 225 feet front in East Twenty-sixth st., near First ave., and costing about $500,000, will be owned by the New York University and used by the united school.

The faculty of the new school will consist of Dr. Edward G. Janeway, dean, and seven professors of the former University Medical faculty, and twenty-one professors and adjunct professors of the former Bellevue Medical faculty, together with such additional professors as may hereafter be appointed. Besides these there are thirty or more lecturers, instructors and assistants. The complete roll of the faculty will hereafter be announced.—*N. Y. Tribune.*

CHANGE OF ADDRESS.

Armstrong, V., from Indianapolis, Ind., to Whitcomb Building Pueblo, Colo.
Brown, M. M., from Pepin, Wis., to Golden, Ill.
Bronnell, W. F., from Chilton to New London, Wis.
Bickle, S. D., from Norristown, Pa., to Atlanta and Illinois Aves., Atlantic City, N. J.
Berry, B., from 3026 Locust St., to 3400 Morgan St., St. Louis, Mo.
Brown, G. V. I., from Duluth, Minn., to Milwaukee, Wis.
Butterfield, F. A., from 713 Ashland Ave. to 624 North St., Rockford, Ill.
Campbell, D. A., from Windsor, Ontario, to Harper Hospital, Detroit, Mich.
Carter, G. D., from St. Louis to New London, Mo.
Fredigke, C. C., from 35th and State to 3243 State St., Chicago.
Goldnamer, W. W., from 2303 State St. to 3454 Indiana Ave., Chicago.
Grieger, H., from Pueblo to 3132 Boulevard, Denver, Colo.
Gray, A., from 248 Winchester Ave. to 456 Ogden Ave., Chicago.
Honan, J. H., from Berlin, Germany, to Rensselaer, Ind.
Hovender, J. H., from Lake View to Lawrence, Iowa.
Hodgkinson, C., from Detroit to 416 E. Cross St., Ypsilanti, Mich.
Hobday, Dr., from Louisville, Ky., to Marshall, Minn.
Homer, H. C., from Crain Creek to Horton, Iowa.
Hicks, J. M., from 171 E. Washington St. to 522 Massachusetts Ave., Indianapolis, Ind.
Johnson, H. C., from Columbia to Meadville, Mo.
Kennedy, W. U., from Winchester to Tallula, Ill.
Leresche, E. P., from 877 S. Spaulding Ave. to 1389 Ogden Ave., Chicago.
Layman, R. B., from Dandridge to Knoxville, Tenn.
Le Moyne, F., from Santa Barbara, Cal., to Pittsburg, Pa.
Malott, J. D., from Amboy to North Grove, Ind.
McFarland, J., from Philadelphia to 421 N. Price St., Germantown, Pa.
Moulton, M. W., from Maquoketa to Bellevue, Iowa.
Pry, E. T., from Knowlton to Tucker, Ark.
Russell, G. M., from Rock Springs to Dixon, Wyo.
Risjord, J. N., from Mt. Horeb, Wis., to Kensett, Iowa.
Reid, W. J., from 244 Alfred St. to 914 18th St., Detroit, Mich.
Rogers, O. L., from Baltimore, Md., to Milledgeville, Ga.
Sheldon, J. G., from Chicago, Ill., to New Haven, Iowa.
Seeley, T. P., from Chicago to Angola, N. Y.
Sherman, A. W., from 944 West Polk to 2400 Dearborn St., Chicago.
Stover, G. H., from 324 Jackson Blk. to 319 McPhee Bldg., Denver, Col.
Sullivan, A. W., from Shiloh, N. J., to Phoenix, Ariz.
Snoddy, F. B., from 1414 H. St. N.W. to 1217 K St. N.W., Washington, D.C.
Sloan, J. F., from Chicago to 613 Wayne St., Peoria, Ill.
Thornton, A. H., from Pocahontas to West Bend, Iowa.
Toan, J. W., from Detroit to Portland, Mich.
Veasey, C. A., from 47 N. 17th to 116 S. 19th St., Philadelphia, Pa.
Wheeler, F. B., from Dows, Iowa, to Strawn, Kan.
Winn, G. L., from Brown Bldg. to Masonic Temple, Rockford, Ill.
Worley, H. F., from Lexington, to Pine Grove, Ky.
Wegge, W. F., from Oshkosh to 693 Cass St., Milwaukee, Wis.

LETTERS RECEIVED.

Alma Sanitarium Co., Alma, Mich.; Ashmead, A. S., New York City; Allport, Frank, Chicago.
Brooks, Leshi E., Mobile, Ala.; Bischoff, C. & Co., New York City; Buck, S. C., Cresco, Iowa; Brothers, S., New York City; Beecroft, Wm. Gird, Madison, Wis.
Chatten, E. A., Earlington, Ky.; Craighead, Erwin, Mobile, Ala.; Crafts, Leo M., Minneapolis, Minn.; Carstens, J. H., Detroit, Mich.; Costner, T. F., Lincolnton, N. C.; Coley, Wm. B., New York.
Daniel, Z. T., Browning, Mont.; Dios Chemical Co. (2), St. Louis, Mo.; Dial, W. H., Laurens, S. C.; Durham, Chas. E., Dublin, Texas; Dunham, W. R., Keene, N. H.
Egan, J. A., Springfield, Ill.; Elliott, H. G., New York.
Fairchild Bros. & Foster, New York City; Frieberg, A. H., Cincinnati, Ohio; Fisher, Geo. Carl, Ann Arbor, Mich.; Freeman, W. C. C., Rock Springs, Wyo.
Goldsmith, M. A. (2), St. Louis, Mo.; Godfrey, E. L. B., Camden, N. J.; Grant, Thomas H., Louisville, Ky.; Grady, Richard, Baltimore, Md.
Hughes, Chas. M., St. Louis, Mo.; Hawkins, T. H., Denver, Colo.; Hacker, M. C., Baraboo, Wis.; Hektoen, L., Chicago; Harvey, G. F. Co. (2), Saratoga Springs, N.Y.; Hallock, G.W., Chicago; Hummel Advertising Agency, A. L. (2), New York City.
Jayne, W. A. (2), Denver, Colo.; Johnson, Geo. W. Dunning, Ill.
Kathorman Chemical Co., St. Louis, Mo.; Kime, J. W., Des Moines, Iowa; Kempson, J. F., New York City; Kress & Owen Co., New York; Karger, S., Berlin, Germany.
Lathe, L. F., Cambridge, Mass.; Lawrence, F. F., Columbus, Ohio; Lichty, D., Rockford, Ill.
McKenney, A. D., Pierson, Iowa; Mulford Co., H. K., Philadelphia; Mariani & Co., New York City; Moody, H. A., Mobile, Ala.; Marks, A. A., New York City; Maltine Co., Brooklyn, N. Y.; Merrick, M. B., Passaic, N. J.; Miller, W. M., Pittsburg, Pa.; Merrell Chemical Co., The W. S.
Netrecht, L., New Bremen, Ohio.; Nutrolactis Co., New York City.
Oakland Chemical Co., New York City; Ohmann-Dumesnil, A. H., St. Louis, Mo.
Pneumachemic Co., Cincinnati, Ohio; Platt, H. B., New York City; Potter, William Warren [2], Buffalo, N. Y.; Plummer, H., Harrodsburg, Ky.; Petersmeyer, Wm., Odebolt, Iowa; Priestley, J. T., Des Moines, Iowa; Parke Davis & Co., Detroit, Mich.
Rodman, Wm. L., Louisville, Ky.; Rogers, John, New York; Root, P. S., Monroe, Mich.; Rosenthal, Edwin, Philadelphia, Pa.; Roseberry, Benj., Florence, Colo.; Reed & Carnrick, New York City; Ryan, L. R., Galesburg, Ill.
Smith, Kline & French Co., Philadelphia, Pa.; Sternberg, Geo. M., Washington, D. C.; Senn, N., Springfield, Ill.; Shelley, J. F. [2], Elmdale, Kan.; Schenck, W. Edwards, Cincinnati, Ohio; Schmitt, F. A., LaGrange, Texas; Stone, Ormond, Charlottesville, Va.; Still, D. V., Johnstown, N. Y.; Shields & Co., New Wilmington, Pa.; Safford, H. E., Detroit, Mich.; Shoemaker, J. V., Philadelphia, Pa.; Semerak, A., Chicago.
Treat & Co., E. B., New York City.
Upjohn Pill and Granule Co., Kalamazoo, Mich.
Wilmot, Castle & Co., Rochester, N. Y.; West, S. L., Philadelphia, Pa.; Woolsey, Geo., New York City; Weis, E. W., Ottawa, Ill.; Whitmore, B. T., New York City; Wherry, J. W., Mt. Pleasant, Iowa; Wilbur, C. T., Kalamazoo, Mich.; Wood, Chas. M., Decatur, Ill.; Warren, W. R. & Co., Philadelphia, Pa.

THE PUBLIC SERVICE.

Army Changes. Official List of Changes in the Stations and duties of officers serving in the Medical Department, U. S. Army, from May 21 to 27, 1898.

Acting Asst. Surgeon Francis W. Harrell, U. S. A., will proceed from Washington, D. C., to San Francisco, Cal., and report in person to the commanding General of the expedition to the Philippine Islands for duty.

First Lieut. William E. Richards, Asst. Surgeon, having reported to the Surgeon-General, in compliance with orders, will proceed to Mobile, Ala., and report in person to the commanding General, Fourth Army Corps, for duty in the field with the Fifth Cavalry.

Capt. Joseph T. Clarke, Asst. Surgeon, will proceed to Tampa, Fla., and report in person to Major-General William R. Shafter, U. S. Volunteers, for assignment to duty.

The following named officers of the Medical Department will proceed to San Francisco, Cal., and report for duty with the expedition to the Philippine Islands: Lieut.-Col. Henry Lippincott, Deputy Surgeon-General; Capt. William O. Owen, Asst. Surgeon; Capt. Edward R. Morris, Asst. Surgeon; First Lieut. Henry Page, Asst. Surgeon.

The following assignments of officers of the Medical Department are made: To First Army Corps, Lieut.-Col. Rush Huidekoper, U. S. Volunteers; to Second Army Corps; Lieut.-Col. Alfred C. Girard, U. S. Vols.; to Third Army Corps, Lieut.-Col. John Van R. Hoff, U. S. Vols.; to Fourth Army Corps, Lieut.-Col. Robert M. O'Reilly, U. S. Vols.; to Fifth Army Corps, Lieut.-Col. Benjamin F. Pope, U. S Vols.; to Sixth Army Corps, Lieut.-Col. Nicholas Senn, U. S. Vols.; to Seventh Army Corps, Lieut.-Col. Louis M. Maus, U. S. Vols.